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Monterey, California



VOICE RECOGNITION VOCABULARY LISTS  
FOR THE ARMY'S TACFIRE SYSTEM

by

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## ABSIRACT

Within the last year, the Naval Postgraduate School has been investigating the feasibility of using voice recognition technology as a possible input methodology to the Army's tactical fire direction system, TACFIRE. A major reason behind considering voice data entry was the desire to increase the speed and accuracy in which data could be entered into the system. In order to evaluate the effectiveness of voice data entry to TACFIRE, the speed and accuracy advantages of voice recognition technology had to be weighed against numerous performance characteristics of available state of the art recognition equipment. One such performance factor was vocabulary size limitation. This report analyzes the vocabulary requirements needed to operate the Artillery Control Console from a Division artillery display group shelter. It also presents the suggested vocabulary organization within the constraints of a specific recognizer which tested to be best suited for the TACFIRE environment.

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VOICE RECOGNITION VOCABULARY  
FOR THE ARMY'S TACFIRE SYSTEM

I. Introduction

Over the last several years the Army has developed a computerized tactical fire direction system, TACFIRE. TACFIRE is a battlefield computer network which along with other field artillery (FA) equipment provides a maneuver commander with a system capable of detecting targets, allocating firepower, and providing fire support within seconds. The computer and communication network provides a means to receive targeting information, calculate necessary firepower, compute ballistic firing data and send firing orders to FA weapons. In a way it can be considered a very large, real time, management information system which can quickly and efficiently make allocation decisions according to a set of preplanned criteria established by a maneuver commander. In order to maintain its real time capability the system must be constantly updated and provided the current assessment of friendly and enemy combat units. This data must be input to the computer system. Therefore, the effectiveness of TACFIRE is directly proportional to the accuracy and currency of the information held by the TACFIRE database.

Presently the majority of the information held by TACFIRE is input through 90 highly formatted message templates. An operator calls up a template display, and proceeds to fill in the necessary information. The message is then sent to the TACFIRE computer for analysis. If the format is filled out properly the data is automatically entered and the

database updated. If the message is improperly filled out an error message is returned to the entry device.

During the summer of 1981 officers from the Army's High Technology Testbed Project at Fort Lewis, Washington observed a demonstration of voice data entry in which an individual could run a computer system by voice commands instead of the more typical keyboard entry. During the spring of 1982 the Naval Postgraduate School under an Army research contract started to formally investigate the possibilities of using presently available voice recognition technology equipment in conjunction with TACFIRE.

The research concentrated on the numerous questions about the capability of the presently available equipment. One of the major questions was the vocabulary size limitations encountered with available recognition units. This report will discuss the TACFIRE vocabulary requirements and analyze the capability of currently available equipment to fulfill those requirements.

This research report will first present a brief description of voice recognition technology and the type of equipment which is readily available, accurate and reliable. It will then discuss the various aspects of vocabulary design which were considered when developing the vocabulary and vocabulary organization. This will be done by presenting a variety of vocabulary possibilities for one specific order, the Update Fire Unit order. Thirdly, the report will describe in detail the vocabularies for the majority of the TACFIRE orders, and the method in which they should be organized. Next a description is given along with the results of a series of tests which were conducted on the vocabulary. Finally, the paper will close with a summary analysis of the developed vocabulary and its usefulness in



running TACFIRE by voice commands.

## II. Voice Recognition Technology

There are numerous types and manufacturers of voice recognition equipment available in today's market. Before the vocabulary could be developed a requirements analysis for the TACFIRE system was performed to determine what equipment characteristics were most important for TACFIRE, and which available recognizer fulfilled the majority of the needs for this application. To better understand the differences a few definitions will first be discussed

### Template matching versus pattern analysis

There are two major methods available to accomplish voice recognition. The first is referred to as template matching. In this method of recognition, the recognition microcomputer holds on to a series of templates of voice patterns. When a user presents an utterance to the recognizer the utterance is compared to all of the templates which are held in computer memory. If there is a template which matches close enough, an associated ASCII character string is sent to the computer system which is connected to the recognizer.

The other method, which is not as well developed at this point in time, is called pattern analysis. The voice pattern of a spoken phrase is analyzed and compared to known wave form characteristics for the various phonetic sounds. From this analysis the word or phrase is deciphered and spelling rules applied to result in the phrase which was spoken.

The template method of voice recognition always results in a system which has a limited vocabulary. The recognizer runs on a microcomputer and there is a limited number of utterance templates which can be held in memory at a given

time. Naturally, memory could be expanded, but the larger the number of templates which must be checked the longer the computation time will be to find the best template match. There are systems available which have internal template storage for 1000 templates, but these have typically been extremely expensive. The majority of the template matching recognizers available are in the 100 to 300 template range, and have a means to interact with developed software to download new sets of templates as needed.

Pattern analysis systems do not have the vocabulary limitation. They simply analyze the wave form of the spoken utterance and if they are good will produce the word or words which were spoken. These recognizers are still in the experimental stage, but even if available would not suit the TACFIRE requirements. Pattern analysis systems output to the attached computer system exactly what was said. In the TACFIRE application this is not what is desired. Voice input will be used in such a way that a spoken utterance will initiate a series of computer commands. For example, one possible utterance will be "transmit message". A pattern analysis system if working properly will output "transmit message", but a template matching system if working properly will match "transmit message" with the "transmit message" template in memory and output the single ASCII character needed by TACFIRE to send the message.

Therefore, the first characteristic of the voice recognizer for TACFIRE is that it be of the readily available template matching type. This then leads straight to the problem of vocabulary limitations and ultimately the vocabulary design discussed in this research report.

#### Discrete utterance versus continuous speech recognizers

One characteristic of the template matching recognizers is the need for the recognition system to distinguish when a complete utterance has been spoken. A discrete utterance recognizer requires that the speaker pause for a short period of time between utterances. This is the indication to the recognition unit that the utterance has been completed and the internally held template can be searched for. A continuous speech recognizer does not require a short pause between utterances. This type of recognizer does some rudimentary pattern analysis and determines where the end of an utterance is possible. It then searches through the available templates. If it does not find a template it will reanalyze the demarkation point it chose and look for another point in the voice pattern where the utterance could have ended.

Discrete utterance recognizers have been readily available for the last five years and have proven to be extremely accurate and reliable. On the other hand, the continuous recognition capability has just been made available within the last year and a half. It is extremely useful when inputting a long series of digits as would be necessary when entering target or unit coordinates in TACFIRE. The problem with continuous recognizers is that they are still a relatively new technology. They are improving at a tremendous rate, but at the time of this research study the following problems were noted with the continuous recognizers.

First, the continuous recognizer usually had a limited vocabulary around 100 words which was on the border line of acceptability for some of the more complicated TACFIRE messages. Secondly, these recognizers worked best when the templates which were held were short 1, 2 or 3 syllable utterances. If the templates were long phrases the

recognizer had numerous possible break points to check while looking for the best combination of possible utterances. This increased the processing time, and there was a definite lag between the time an utterance was spoken and the output associated with the series of utterances was sent to the computer system.

For these reasons, only discrete utterance systems were considered for the TACFIRE application. Because of this decision there was no need to consider the effect of what the authors call subset utterances when developing the vocabulary. For example there are several vocabularies which have an utterance "one fifty five millimeter" and the utterance "one". With a continuous recognizer it appears as if it is very possible for the recognizer to pick a break point after the "one" in "one fifty five millimeter" thereby causing the output of a numeral "1" when it was not wanted. With the discrete utterance system this could not happen; therefore, it did not have to be considered when developing the vocabulary.

#### User dependent versus user independent systems

This characteristic of the system has no impact on vocabulary design, but is included for completeness because it does effect the time required to prepare the system for use by an individual. A user dependent system requires that each person who will use the voice recognition system must train the recognizer. Train the recognizer means that each utterance must be spoken by the individuals who plan to use the system in order that the system can create and store the necessary utterance templates. This training period can be time consuming especially when the vocabulary is extremely large. Once done though it will never have to be done again. Every person who would use the system would have

their voice templates stored for quick recall. A user independent system does not require that users train the system to recognize their voices. As with continuous speech recognizers, great advancements in user independent systems are being made. There are user independent systems available which recognize the ten digits and various other phrases such as "yes" and "no", but these systems are not advanced enough to recognize the large and diverse vocabulary necessary for TACFIRE. Therefore, the systems considered for TACFIRE were of the user dependent variety. As a side note, numerous studies were conducted under the auspices of this research project to investigate group independence capability of the user dependent systems. These reports will also be available in the near future from the Naval Postgraduate School.

#### Set Definition

The majority of available recognizers have a capability to use what are called vocabulary sets to increase the speed and accuracy with which utterance template matching can be accomplished. A vocabulary set is an utterance subset of the total vocabulary stored in the recognizer's memory. When initiated it tells the recognizer to only search through this subset of utterance templates for the proper match. Subsets are initiated either by system software control or by the computer system (in this case TACFIRE) sending an appropriate character string to the recognizer to change vocabulary sets. It is not a trivial task to get any highly specialized computer system such as TACFIRE to do this.

For this reason it was initially determined that sets would not be used within the TACFIRE vocabulary development. Therefore, this capability is not built in to the vocabulary

design. It should be noted that it became apparent as the research team was developing and using an actual recognition system with TACFIRE that it was inappropriate to try and retrofit a voice recognition unit to TACFIRE. If voice input technology is determined beneficial, a recognizer should be developed and internally integrated into the TACFIRE system. If this is the case the associated development plan should consider using the set capability. This aspect of the vocabulary design will be discussed with an example later in this research report.

In summary, the vocabulary which was developed and organized assumed that a user dependent, discrete utterance, template matching system would be used in conjunction with TACFIRE. The only characteristic of the recognition system, which if changed, could possibly affect the vocabulary design is the discrete utterance capability.

### III. Design Considerations

Two individual discrete utterance, user dependent voice recognition systems were considered for the demonstration implementation of voice recognition technology to TACFIRE. The first recognizer was the Threshold Technology Inc. model T600. The second possible recognizer was a board level recognizer which was incorporated into a Heath-Zenith, 289 based microcomputer. The recognizer was manufactured by Interstate Corporation, and was called the VRT101.

The T600 had a 256 utterance capacity, but required that vocabularies be stored on an external data tape cartridge. Threshold also has a model T500 which allows voice pattern templates and the vocabulary to be stored on the host computer. Since it was impossible to change in any way the TACFIRE system the T600 was the only Threshold model which could be considered.

The Interstate VRT101 has a 100 word capacity, but allowed the vocabulary and pattern templates to be stored on either a hard disk or floppy disk which could be automatically downloaded through software resident on the microcomputer. The software would have to be especially developed for the TACFIRE system, but would not have to be resident on the TACFIRE computer.

It was realized from the beginning that there were numerous TACFIRE message templates, and therefore more vocabulary words than either recognizer could hold in memory at once. The 256 word capacity of the Threshold was more than sufficient for any one message template, but the 100 word capacity of the Interstate was insufficient for some of the longer more complicated messages. Furthermore, the T600



appeared to have a better recognition capability during some pilot runs on test vocabularies. On the other hand, the VRT101 did have a much nicer capability to automatically download vocabularies instead of manually loading a tape as needed with the T600 available for the demonstration. The VRT101 also had the capability to output up to 80 ASCII characters when a voice template was matched. The Threshold only had a 16 character output capability.

Since each system had advantages and disadvantages, a decision had to be made with respect to the quality which was of most importance to the demonstration. It was felt that recognition accuracy was most important and the T600 was chosen. Therefore, the vocabulary was initially designed with the T600 constraints of a 256 word capacity and a 16 character maximum output string.

The vocabulary was redesigned numerous times in an attempt to take advantage of as many of the characteristics of voice input technology as possible. The following vocabulary was designed for one of the more important TACFIRE messages, the Update Fire Unit message. First, the entire message vocabulary will be specified. Immediately following the vocabulary list are the major advantages and considerations taken in the design of the vocabulary. Thirdly, the implementation problems encountered will be discussed. Because of the implementation problems, some of the original assumptions of the recognizer characteristics had to be changed.

The following vocabulary list will give the word number, the phrase which should be spoken and the output that will result if a correct match is made with the pattern template held by the recognition unit. The following convention will be used when describing the output stream.

1. The lower case letter "d" will stand for down cursor. This results in the cursor moving down one line on the TACFIRE screen but does not change the column position.
2. The lower case letter "c" will stand for cursor reset. This results in the cursor being repositioned to the top left hand corner of the TACFIRE message template.
3. The lower case letter "t" will stand for tab. This results in the cursor automatically moving to the column immediately following the next encountered ":" in the message template.
4. The lower case "n" will stand for a null character. A null character has no affect on TACFIRE and it will do nothing on the TACFIRE screen.
5. The lower case letter "r" will represent right cursor. This will move the cursor one space to the right on the TACFIRE screen.
6. The lower case letter "l" will represent left cursor.
7. All upper case letters in the output string will appear on the TACFIRE screen just as if they were entered through the keyboard. TACFIRE in fact only accepts upper case ASCII characters.
8. An underline character ("\_") represents a blank space and is equivalent to depressing the space bar on the TACFIRE keyboard. This result in erasing what is presently located at that position on the message template.

Update Fire Unit

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0



68	Ammunition	cd d d t t t t t t l
69	High Explosive	r H E
70	Chemical	r C H
71	Nuclear	r N U
72	All weapon types	r A I C
73	All plans	cd t t A L L c
74	32 hundred mil sight	cd d d t t t t t t t 1 c
75	64 hundred mil sight	cd d d t t t t t t t 2 c
76	Bearing Sight	cd d d t t t t t t t 3 c
77	Zone of Responsibility	cd d d t t t t t t t
78	Weapon strength	cd d d d t
79	Azimuth	cd d d d t t t
80	Response Time	cd d d d t t t t
81	Cannon	cd d d d d t t t t c c
82	Missile Rocket	cd d d d d t t t t M C
83	Air	cd d d d d t t t t A C
84	Navy	cd d d d d t t t t N C
85	Reinforced Unit	cd d d d d t t t t t
86	Force supported	cd d d d d t t t t t
87	Delete request	cd d d d d t t t t X C
88	Fire Unit Reaction Time	cd d d d d t t t
89	Radiation	cd d d d d t t t t
90	Unit Ready	cd d d d d t t t t t t X c
91	Out until	cd d d d d t t t t t t
92	Basic load	cd d d d d t t t t t t
93	Minimum Range	cd d d d d t t t t t t t
94	Date Time Group	cd d d d d t
95	CURSOR reset	c
96	Right	r
97	Left	l
98	Erase Plan	cd t
99	Erase unit	/ 7 7 7 --- 7 --- c
100	Erase weapon	cd t t t t --- c
101	Erase model	cd t t t t --- c
102	Erase mission	cd t t t t t --- c
103	Erase ammunition	cd d t t t t t --- 7 --- c
104	Erase sight	cd d t t t t t t --- c --- c
105	Erase zone	cd d t t t t t t --- c
106	Do Not Delete	cd d d d t t c --- c
107	Unit Not ready	cd d d d d t t t t c
108	Pershing	cd t t t t P E R S H i n g X M 7 9 0 c

The remaining words should be filled with specific names of fire units, forces which could be supported and units being reinforced. From discussions with some Army officers this could be as many as 90 different unit names. Each unit name would output the entire 12 alpha numeric designator with all appropriate spacing, and "/" marks which TACFIRE expects. The remaining words should also include the Plan names and Zone of Responsibility names.

Before explaining the implementation problems encountered with the above vocabulary, it is appropriate to explain some of the reasoning behind developing the output as indicated in the above list. Appendix A has a copy of the Update Fire

Unit message template and can be referred to in the following discussion.

First, all words started out with a cursor reset and ended with a cursor reset if appropriate. This was done to minimize any possible errors due to misrecognitions. Keywords and necessary punctuation in FACFIRE message templates can easily be written over. In fact this is one of the major difficulties encountered by FACFIRE operators. If the template format is altered in any way the operator must either recreate the correct format from memory or by referring to an appropriate reference manual. The cursor reset therefore insures that if a misrecognition does occur the misrecognized word will likely be put in its correct template location thus not inadvertently erasing another portion of the template. The erase commands provided could then be used to correct the error.

The first ten words are the digits and do not have the cursor reset. They will be used to input coordinates, OUT UNTIL times, minimum range values and the date time group values. A cursor reset word is also given so the operator can reset the cursor after these numeric fields have been entered, but is not always necessary because of the cursor resets done at the beginning of the majority of the other vocabulary words.

There are several words such as "Plan name" which do not end with a cursor reset. These phrases result in the cursor being positioned within the message template and serve as a prompt to the operator that further input is needed. A good example of this is the input of weapon and model types. For example, there are numerous possible model types for the 105 MM gun. When the operator says "1 0 5 millimeter", the cursor is reset, then positioned after the WPN heading on

the template, and next the field filled in with "105MM". The cursor is then moved to the position needed to fill in the model type. This will then serve as the prompt to the operator that a model type is needed. As an alternate example, the Honest John weapon does not need a special model type. Therefore, when the operator says "Honest John", the cursor is reset, positioned to the appropriate field and "HJ" output. The output string also contains the ASCII characters needed to move the cursor to the model field, fill in the model type "HJ", and then reset the cursor ready for the next input.

Because of the 16 character output limitation words 35 through 39 had to have the final cursor reset character dropped. The cursor reset was chosen to occur at the beginning of the output string to make sure that if any of those words were chosen as a result of a misrecognition they would not erase an inappropriate portion of the template. The cursor remaining at the end of the model field should serve as a prompt to the operator to reset the cursor through the voice command, Word 95.

The coordinate field of the update fire unit message expects as an input the east coordinate, north coordinate and altitude. Word 62 and 63 are unique in that they were formulated so the operator did not need to input the northern coordinates or altitude at the same time the east coordinate is input. All three values can be input in any order desired. If the operator so chooses the altitude can be placed in first by saying "Altitude". This will position the cursor after the second "/" mark in the coordinate field ready for the numeric entry of altitude. The same is true for both the easting and northing coordinates.

The ammunition field allows for a series of one or two

legal entries. To allow for any serial combination of the legal entries the following scheme was devised. The operator will say "ammunition", this will place the cursor one column to the left of where the first ammunition type is to be input. Then the ammunition types can be entered. For example, the phrase "High Explosive" will result in the cursor moving one space to the right and outputting the "HE" required by TACFIRE. The cursor is then positioned on the "/" mark in the ammunition field. Again this is a prompt to the operator that an additional ammunition type can be input if desired. If another ammunition type is desired it can be entered. This phrase will also move the cursor one position right, in order that the "/" mark is not erased and enter the next ammunition type. This scheme therefore allows the ammunition types to be placed in any desired order in the ammunition field. It is again suggested that the operator give the "cursor reset" command when finished entering data in this field.

Another advantage associated with the voice entry methodology given in the above vocabulary is exemplified in words 74 through 76. These words are used to fill the sight type field. This field is numerically coded. For example, a numeral 1 means 3200 sight; therefore, when the operator says "32 Hundred Sight", the cursor is positioned in the appropriate place, the numeral 1 is output, and the cursor is reset awaiting the next input. This method eliminates any need for the operators to memorize any numerical coding schemes inherent to TACFIRE.

A similar advantage is seen in the "Delete Request" and "Unit Ready" words, number 87 and 90 respectively. These two fields are boolean on/off switches. By placing an "X" in the field the appropriate switch is set to represent the desire to delete a request or set a unit to ready. The

output from these two utterances will be to position the cursor appropriately, place the X in the field, and as always, when possible, reset the cursor awaiting the next input.

Finally, there are a series of words used to erase entire fields in case an error was made or the operator changed his mind. The erase unit command is intended to be used for the three unit identifying fields associated with the Update Fire Unit message. The erase weapon command could not erase both the weapon and model field at once because of the 16 character output limitation so two separate commands were formed.

### Implementation Problems

When the above vocabulary was implemented using the Threshold T600 one major problem was encountered. TACFIRE expects a 250 millisecond delay after the down cursor command and reset cursor command. The Threshold unit does not allow for such a delay. Because of this situation the 2 or 3 characters immediately following either the down cursor or reset cursor commands were never received by TACFIRE because TACFIRE was not prepared to receive them. The only way available to insure that characters were not lost was to place 3 null characters after each down cursor and cursor reset command. For example Word 10, "Plan Name", would require an output string "cnnndnnnt". This is irritating but for this specific word there is no degradation in the vocabulary capability. Unfortunately, that is not true for the majority of the rest of the words. The 16 character output limitation had already caused some inconvenience and with the additional need to add 3 null character after each down cursor the problem would expand greatly. Of the 108 word list given above 63 words would have to change because



they would no longer fit within the 16 character limitation. The changes necessary would require that additional words be created and this was deemed inefficient and contradictory to the reasons for considering the implementation of voice control to TACFIRE.

Threshold Inc. was contacted and the researchers were told that there was nothing prohibiting the expansion of the output character stream. It was a manufacturing change which could easily be accommodated if the need ever arose. For this reason the 16 character limit associated with the output string was ignored throughout the remaining vocabulary development. The impact of this decision will be discussed during the final analysis of the vocabulary.

#### IV. TACFIRE Vocabulary

The following vocabulary was developed for use with the TACFIRE system. The Department of the Army Operator's Manuals for the Division Fire Direction Center, dated March 1980, (TM 11-7440-241-10-5 through TM 11-7440-241-10-9) were used as references in the vocabulary development.

The vocabulary which should be loaded as soon as TACFIRE is brought on line is the vocabulary needed to access the major TACFIRE functions. Each word in this vocabulary will bring up the message directory for the specific function and at the same time bring in a new vocabulary list necessary for the operation of the function directory.

##### Function vocabulary

The output string necessary to bring up the specific function directories was not documented. The output string needed for this small vocabulary list will need to be determined if ever implemented into TACFIRE.

Word number	Phrase Spoken
0	Support Directory
1	Ammunition and Fire Unit Directory
2	Meteorological Directory
3	Tactical Fire Control Directory
4	Non-nuclear Fire Planning Directory
5	Artillery Target Intelligence Directory
6	Survey Directory

Each of these phrases would then output the necessary command to call the appropriate directory and place it on the TACFIRE screen. Each of these specific function directories has a list of the available message templates to support the function. The following vocabulary lists are the words necessary to display the individual message templates from each of the TACFIRE function directories. It

is assumed that each vocabulary would be automatically downloaded when the directory is placed on the TACFIRE display.

Support Directory

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Map mod	d
1	D P M orientation	dt
2	Alter geometry file	dttt
3	Zone of responsibility	dtttt
4	Air corridor	dttttt
5	Weapon descriptor table	dttttttt
6	Display position	dtttttttt
7	User commands	dttttttttt
8	Build a plan	dtttttttttt
9	Damage avoidance area	dt
10	Not that one	c

Ammunition and Fire Unit Directory

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Fire unit update	d
1	Launch site update	dt
2	Ammunition update	dttt
3	Ammunition level	dtttt
4	Available supply rate	dttttt
5	Nonnuclear mission report	dttttttt
6	Nuclear mission report	dtttttttt
7	Build a plan	dttttttttt
8	User commands	dtttttttttt
9	Situation report	dt
10	Not that one	c

There is an important point to notice about the first two directory vocabularies. Each vocabulary has the phrases "Build a plan" and "User commands", but the output is different for both of them. To call up a specific message from a directory the cursor is placed under the first letter of the message type. In the Support Directory the "Build a plan" message type is listed in the eighth position. That is why the output string tabs over eight times. On the other hand, "Build a plan" is seventh on the Ammunition and Fire Unit list, thus the output string has seven tabs

output. This is why each directory needed a separate vocabulary because the same phrases could not be used by two different directories. Ironically, "User commands" requires 7 tabs in the Support function directory and eight tabs in the Ammunition and Fire Unit Directory. If voice is ever implemented into TACFIRE a redesign of the directory and message templates could allow for a simpler vocabulary design.

### Meteorological Directory

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Send met data	d
1	Fallout prediction	d,t
2	Met forecast	d,t,t
3	User commands	d,t,t,t
4	Not that one	G

### Tactical Fire Control Directory

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Request for additional fire	d
1	Capability analysis	d,t
2	User commands	d,t,t
3	Modify commander's criteria	d,t,t,t
4	Fire unit selection criteria	d,t,t,t,t
5	Fire unit exclusions	d,t,t,t,t,t
6	Attack method	d,t,t,t,t,t,t
7	Subsequent commands	d,t,t,t,t,t,t,t
8	Message to observer	d,t,t,t,t,t,t,t,t
9	Forward observer command	d,d
10	Not that one	G

### Non-Nuclear Fire Planning Directory

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Compute a fire plan	d
1	Scheduling instructions	d,t
2	Reserve fire unit	d,t,t
3	Fire planning target update	d,t,t,t
4	Fire plan alteration	d,t,t,t,t
5	User commands	d,t,t,t,t,t
6	Modification criteria	d,t,t,t,t,t,t
7	Fire unit selection criteria	d,t,t,t,t,t,t,t
8	Fire unit exclusions	d,t,t,t,t,t,t,t,t
9	Attack method	d,d
10	Not that one	G

## Artillery Target Intelligence Directory

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Coordinate report	a
1	Azimuth distance report	a
2	Target report	a
3	Shelling report	a
4	Nonnuclear mission report	a
5	Surveillance report	a
6	Combat information report	a
7	Query	a
8	S R I	a
9	prepare a fire plan	a
10	User commands	a
11	Search	a
12	Final solution	a
13	Combine targets	a
14	Split target	a
15	Database modification	a
16	Standard value criteria	a
17	Fire mission criteria	a
18	Target buildup criteria	a
19	Data print criteria	a
20	Not that one	a

## Survey Directory

<u>Word number</u>	<u>Phrase Spoken</u>
0	Assembly
1	Access
2	Storage
3	Save
4	Retrieve
5	Survey data transmission
6	Print survey data
7	Delete survey data
8	Azimuth and distance
9	Geo to U T M
10	U T M to Geo
11	True to grid
12	Zone to zone coordinates
13	Survey criteria
14	Traverse data input
15	Traverse to common control
16	Traverse scheme adjustment
17	Combine traverse adjustment
18	Intersection data
19	Intersection with base points
20	Triangulation data
21	Trilateration data
22	Quadrilateral data
23	Two point resection data
24	Three point resection data
25	Azimuth by altitude
26	Azimuth by hour angle
27	Final astronomic azimuth
28	Not that one

The documentation did not include the Survey directory;

therefore, the specific output could not be determined. It would be similar to the output provided for all of the other directory vocabularies. It is assumed that the cursor must be placed under the first letter of the message template name. This can always be done with a series of down cursor and tab commands.

Next each of the message template vocabularies will be presented. There are 91 vocabularies and they will be organized within each major function. When a directory calls up a specific message template a special vocabulary for that template will have to be loaded into the voice recognition unit. Hopefully, the system would be integrated into TACFIRE so the loading of the vocabulary would be automatic.

Support Function - Map Mod

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	Eastern edge	cdt
11	Western edge	cdttt rrrrrrr
12	Northern edge	cdttt
13	Southern edge	cdttt rrrrrrrrrrr
14	Grid Zone	cdttt
15	Spheroid	cdttt t
16	Latitude northern edge	cdttt
17	Latitude southern edge	cdttt rrrrrrrrrrrrrrrrrrr
18	Longitude eastern edge	cdttt
19	Longitude western edge	cdttt rrrrrrrrrrrrrrrrrrr
20	Degrees	rrrr
21	Minutes	rrrr
22	Seconds	rrrr
23	Major axis	cdttt
24	Minor axis	cdttt
25	Cursor reset	c
26	Erase eastern edge	cdt
27	Erase western edge	cdttt rrrrrrr / _____ c
28	Erase northern edge	cdttt _____ c
29	Erase southern edge	cdttt rrrrrrrrr / _____ c

30	Phrase	grid zone	cdtXc
31	Phrase	latitude north	cdtt
32	Phrase	latitude south	cdtt
33	Phrase	longitude east	cdtt
34	Phrase	longitude west	cdtt
35	Phrase	major axis	cdtt
36	Phrase	minor axis	cdtt
37	Right		r
38	Left		l
39	Phrase	it	-

Support Function - DPM Orientation

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	Delete request	cdtXc
11	Spheroid	cdtt
12	Do not delete	cdtt_c
13	Right	r
14	Left	l
15	Reset cursor	c
16	Coordinate one	ddt
17	Coordinate 2	ddtt

The specific eastern, northern and grid zone sub-fields of the COORD1 and COORD2 fields were not made accessible by voice commands in this vocabulary. This was possible, but the wording of the phrases for coordinate one east first iteration, and coordinate one east second iteration etc. became very cumbersome, and it was felt that voice control was not helping the input process at all in this circumstance. Therefore, the operator should just state which field is to be filled such as "coordinate one", and then either by keyboard or voice, enter all six sub-fields of COORD1 at once.

Support Function - Alter Geometry

<u>Word</u>	<u>number</u>	<u>Phrase</u>	<u>Spoken</u>	<u>Output</u>	<u>string</u>
0		Zero		0	
1		One		1	
2		Two		2	
3		Three		3	
4		Four		4	
5		Five		5	
6		Six		6	
7		Seven		7	
8		Eight		8	
9		Nine		9	
10		Plan	Name	cdt	
11		Name	of specified geometry	cdttt	
12		Date	time group	cdtttt	
13		Day		tt	
14		Hour		tt	
15		Minute		tt	
16		Fire	unit	cdttttt	
17		Delete	request	cdttttttXc	
18		Line	of departure	cdtttXc	
19		FEBA		cdtttXc	
20		Coordinate	fire line	cdttttXc	
21		Restrictive	fire line	cdttttttXc	
22		Free	fire area	cdttttttttXc	
23		No	fire area	cdttttttttXc	
24		Restrictive	fire area	cdttttttttXc	
25		Dead	space area	cdttttttttXc	
26		Damage	avoidance area	cdttttttttttXc	
27		Fire	support coordination	cdttttttttttXc	
28		Chemical	hazard area	cdttttttttttXc	
29		Ammunition	restriction	cdttttttttttt	
30		High	explosive	rHF	
31		Chemical		rCH	
32		Nuclear		rNU	
33		All	weapon types	rALC	
34		Target	type	cdtttttttttttt	
35		Air	defense artillery	ADAC	
36		Armor		ARMORC	
37		Artillery		ARTYC	
38		Assembly	areas	ASSYC	
39		Building		BLDGC	
40		Bridge		BRIDGEc	
41		Center		CENc	
42		Equipment		EQUIPC	
43		Mortars		MORTC	
44		Personnel		PERSONC	
45		Rockets	or Missiles	RKTMSLC	
46		Special	missions	SPECc	
47		Supply	dump	SUPPLYC	
48		Terrain	features	TERFC	
49		Vehicles		VEHc	
50		Weapons		WFNC	
51		Coordinating	agency	cdttt	
52		Limit	factor type	cdttttt	
53		Damage	fixed bridge	tt	
54		Friendly	Aircraft	tt	
55		Trees	blown down	tt	
56		Trees	blown down	tt	
57		Trees	green	tt	
58		Trees	dry	tt	
59		Radiation		tt	
60		Circular	area	cdtttttt	
61		Troop	safety	cdttttttttXc	
62		Point	coordinate one	cdttttt	
63		Point	coordinate two	cdttttt	
64		Point	coordinate three	cdttttt	



65	Grid zone	cdadddd
66	Subfield	cdadddd
67	Additional points	cdaddddttYc
68	Erase plan name	cdtt_c
69	Erase specified geometry	cdtt_c
70	Erase fire unit	cdtt77_c
71	Do not delete	cdtt_c/_/_/_/_c
72	Erase line of departure	cdtt_c
73	Erase FETA	cdtt_c
74	Erase coordinate fire line	cdtt_c
75	Erase restrictive fire line	cdtt_c
76	Erase free fire area	cdtt_c
77	Erase no fire area	cdtt_c
78	Erase restrictive fire area	cdtt_c
79	Erase dead space area	cdtt_c
80	Erase damage avoidance area	cdtt_c
81	Erase fire support	cdtt_c
82	Erase chemical hazard area	cdtt_c
83	Erase ammunition restriction	tt_c
84	Erase target type	cdtttttttttt_c
85	Erase limit factor	tt_c
86	Erase troop safety	cdtttttt_c
87	Erase additional points	cdaddddtt_c
88	Erase	tt_c
88	Cursor reset	tt

The remaining words would be used for plan names, names of specified geometries, fire unit names, and coordinating agencies. The subfields of the circular area field could have been individually accessible by voice commands, but they were not. This was done because it was very cumbersome to access the point coordinate subfields individually. The vocabulary developers felt that confusion would result if some subfields were accessible in a given message while others were not.

Another interesting aspect of the above vocabulary is that two and sometimes three phrases access the same template field. For example words 18 and 19 both access the field "FRLT". This was done because that field takes on a different meaning whether geometry about a defensive or offensive position is being given. It was felt that the field was easier to remember given what it would stand for in any given situation, and not the generalized title associated with the field name.

Support Function - Zone of Responsibility

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	plan name	cdt
11	Zone name	cdttt
12	Adjacent zone one	cdtttt
13	Adjacent zone two	cdtttttttttttt
14	Date time group	cdttttt
15	Day	t
16	Minute	tt
17	Hour	tt
18	point coordinate one	cdadt
19	point coordinate two	cdadadt
20	point coordinate three	cdadadadt
21	point coordinate four	cdadadadadt
22	Delete request	cdadtXc
23	Do not delete	cdadt-c
24	Grid zone	cdadt-
25	Spheroid	cdadt
26	Additional points	cdadadadtXc
27	Erase additional points	cdadadadt-c
28	Overlap distance	cdadadadt
29	boundary number one	cdadadadt
30	Boundary name	t
31	Boundary number two	cdadadadt
32	Erase boundary name	t
33	Cursor reset	c-----
34	Erase	-

The remaining words should consist of plan names, zone names and boundary names. Each name should end in a cursor reset for maximum efficiency and reliability.

Support Function - Air Corridor

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6

7	Seven	7
8	Eight	8
9	Nine	9
10	Plan Name	cdt
11	Name	cdttt
12	Date time group	cdtttt
13	Delete request	cdttttXc
14	Do not delete request	cdtttt_c
15	Day	rrrr
16	Minute	rrrr
17	Hour	rrrr
18	East start point	cd dt
19	North	rrrr
20	East end point	cd ddt
21	Start grid zone	cd ddt
22	End grid zone	cd ddt
23	Start spheroid	cd ddt
24	End spheroid	cd ddt
25	Minimum altitude	cd ddt
26	Maximum altitude	cd ddt
27	Corridor width	cd ddt
28	Cursor reset	c
29	Phase plan name	cdt _____c
30	Phase corridor name	cdt _____c
31	Erase	-

Support Function - Weapon Descriptor Table Maintenance

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	Traverse limits	cdtttt
11	Maximum rate of fire	cd dt
12	1 0 5 millimeter	cdt105MMrrr
13	Mike 1 0 1	M101rrrr
14	Mike 1 0 1 Alpha 1	M101A1r
15	Mike 1 0 2	M102rrrr
16	Mike 1 0 8	M108rrrr
17	1 5 5 millimeter	cdt155MMrrr
18	Mike 1 0 9	M109rrrr
19	Mike 1 0 9 Alpha 1	M109A1r
20	Mike 1 1 4 Alpha 1	M114A1r
21	Mike 1 1 4 Alpha 2	M114A2r
22	1 7 5 millimeter	cdt175MMrrr
23	Mike 1 0 7	M107rrrr
24	Mike 1 0 7 Echo 1	M107E1r
25	Eight Inch	cdt8INrrrrr
26	Mike 1 1 0	M110rrrr
27	Mike 1 1 0 Alpha 1	M110A1r
28	Mike 1 1 0 Alpha 2	M112A2r
29	Honest John	cdtHJrrrrrrM386rrr
30	Lance	cdtLANCERrrr
31	Xray Mike 7 4 0	XM740rrr
32	Xray Mike 7 5 2	XM752rrr
33	Hercules	cdtHERCrrrrHERCrrr

34	M 9 1		cdtM91	1111111111	M9111111111
35	3 inch	50	cdt3IN50	1111111111	3IN5011111111
36	5 inch	38	cdt5IN38	1111111111	5IN3811111111
37	5 inch	54	cdt5IN54	1111111111	5IN5411111111
38	6 inch	47	cdt6IN47	1111111111	6IN4711111111
39	8 inch	55	cdt8IN55	1111111111	8IN5511111111
40	Foxtrot	4 Delta	cdtF4D	1111111111	F4D1111111111
41	Foxtrot	4 Echo	cdtF4E	1111111111	F4E1111111111
42	Foxtrot	100	cdtF4100	1111111111	F410011111111
43	Foxtrot	1 11	cdtF1111	1111111111	F111111111111
44	Foxtrot	1 0 5	cdtF105	1111111111	F10511111111
45	Alpha	7 Charlie	cdtA7C	1111111111	A7C1111111111
46	Alpha	7 Echo	cdtA7E	1111111111	A7E1111111111
47	Alpha	4 Echo	cdtA4E	1111111111	A4E1111111111
48	Alpha	4 Foxtrot	cdtA4F	1111111111	A4F1111111111
49	Alpha	4 Mike	cdtA4M	1111111111	A4M1111111111
50	Alpha	6 Alpha	cdtA6A	1111111111	A6A1111111111
51	Alpha	6 Echo	cdtA6E	1111111111	A6E1111111111
52	Alpha	10	cdtA10	1111111111	A101111111111
53	Foxtrot	4 Charlie	cdtF4C	1111111111	F4C1111111111
54	Alpha	7 Delta	cdtA7D	1111111111	A7D1111111111
55	Foxtrot	4 Bravo	cdtF4B	1111111111	F4B1111111111
56	Foxtrot	4 Juliet	cdtF4J	1111111111	F4J1111111111
57	Rocket		cdt1111111111111111	1111111111	ROCKET1111111111
58	Cannon		cdt1111111111111111	1111111111	CANNON1111111111
59	Missile		cdt1111111111111111	1111111111	MISSILE1111111111
60	Air		cdt1111111111111111	1111111111	AIRC111111111111
61	NAVY		cdt1111111111111111	1111111111	NAVY111111111111
62	Sustained rate of fire		cdt		
63	Erase weapon type		cdt		
64	High explosive indicator		cdtXXXXXXXX		
65	Chemical indicator		cdtXXXXXXXX		
66	Nuclear indicator		cdtXXXXXXXX		
67	Erase high explosive		cdtXXXXX_c		
68	Ammunition		cdt1		
69	High Explosive		=HE		
70	Chemical		ICH		
71	Nuclear		RNU		
72	All weapon types		RALC		
73	Erase chemical indicator		cdtXXXXXXXX_c		
74	Erase nuclear indicator		cdtXXXXXXXX_c		
75	Maximum range		cdt		
76	Minimum range		cdt		
77	Radius of effects		cdt		
78	Nuclear ammunition mark		cdt		
79	Nuclear ammunition mod		=		
80	Nuclear yield		=		
81	Circular error		cdt		
82	Range error		cdt		
83	Deflection error		cdt		
84	Height error		cdt		
85	Range of errors		cdt		
86	Pershing		cdtPERSH		

It was not known whether a specific weapon and model always had the same weapon classification. If this is the situation then the weapon description can be changed to immediately output the proper classification for each of the weapon types and/or model voice command. For example, if an

A7C is always classified an "AIR" type weapon, the output string associated with the voice command "Alpha 7 Charlie" should be "cdtA7CrrrrA7CrrrrAIRc". This would increase efficiency and reduce the vocabulary. If a weapon or model type can in fact have more than one classification under different circumstances then the vocabulary as stated above is needed

Support Function - Display Friendly/Enemy Position

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	View indicator	cdtXc
11	Erase view indicator	cdt c
12	Show indicator	cdtXc
13	Erase show indicator	cdt c
14	Enemy indicator	cdtXc
15	Erase enemy indicator	cdt c
16	Coordinate east	cdtE
17	Coordinate north	cdtNrrrrrrrrrr
18	Grid zone	cdtE
19	Spheroid	cdtE
20	Unit symbol	cdtUNITc
21	Outpost symbol	cdtOPc
22	Headquarters symbol	cdtHQc
23	Logistic symbol	cdtLOGc
24	Erase symbol	cdt c
25	Branch	cdtI---c
26	Air Cavalry	ACAVrrrr
27	Air defense	ADEFrrrr
28	Armor	ARMORrrrr
29	Artillery	ARTYrrrr
30	Army security agency	ASASrrrr
31	Aviation	AVrrrrrr
32	Coast artillery	CCARTYrr
33	Cavalry	CAVrrrrr
34	C B R	CBRRrrrr
35	Engineer	ENGRrrrr
36	Nike Hercules	HERCHrrr
37	Infantry	INFrrrrr
38	Medical	MEDErrrr
39	Military intelligence	MINTrrrr
40	Military police	MPrrrrrr
41	Ordance	ORDrrrrr
42	Finance	FINrrrrr
43	Quartermaster	QRTrrrrr
44	Special forces	SFRrrrrr

45	Signal	HSIGNTT
46	Topographic	HTOPTT
47	Transportation	HTRANNT
48	Transportation aviation	HTRANAV
49	Transportation helicopter	HTRANHE
50	Transportation medium air	HTRANMA
51	Erase branch	cdttt
52	Display type	cdttt
53	Unknown	UNKR
54	Right	R
55	Mobile	MBLEC
56	Mortar	MRTRC
57	Self propelled	SPC
58	Towed	TOWC
59	Main	MAINC
60	Honest John	H-JC
61	Artillery caliber	ARTC
62	Hercules	HERCC
63	Army	cdtttttARMYC
64	Army group	cdtttttARGRC
65	Brigade	cdtttttBDEC
66	Battalion	cdtttttBNC
67	Battery	cdtttttBTRC
68	Company	cdtttttCOC
69	Corps	cdtttttCORPSc
70	Division	cdtttttDIVC
71	Group	cdtttttGRC
72	Platoon	cdtttttPLTC
73	Regiment	cdtttttREGC
74	Section	cdtttttSECTC
75	Squad	cdtttttSOC
76	Squadron	cdtttttSQNC
77	Erase unit size	cdtttt
78	Unit name	cdttt
79	Parent unit name	cdtttt
80	Erase unit name	cdttt
81	Erase parent unit	cdttt

The remaining words should be made up of unit names and parent unit names.

Support Function - Build a Plan

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	New plan name	cdttt
1	Specified geometry	cdtttt
2	Erase new name	cdttt
3	Erase geometry name	cdttt
4	Zone of responsibility	cdtttXc
5	Erase zone of responsibility	cdttt
6	Line of departure	cdtttXc
7	Erase line of departure	cdttt
8	FEBA	cdtttXc
9	Erase FEBA	cdttt
10	Plan Name	cdtt
11	Air space coordination	cdttttXc
12	Erase air space coordination	cdtttt
13	Free fire area	cdttttXc

14	Erase fire area	Cdddttttttttc
15	Erase fire area	Cdddttttttttc
16	Erase fire area	Cdddttttttttc
17	Erase fire area	Cdddttttttttc
18	Erase fire area	Cdddttttttttc
19	Coordinate fire line	Cdddttttttttc
20	Erase coordinated fire line	Cdddttttttttc
21	Dead space area	Cdddttttttttc
22	Erase dead space area	Cdddttttttttc
23	Fire support coordination	Cdddttttttttc
24	Erase fire support	Cdddttttttttc
25	Chemical hazard area	Cdddttttttttc
26	Erase chemical hazard area	Cdddttttttttc
27	Damage avoidance area	Cdddttttttttc
28	Erase damage avoidance area	Cdddttttttttc

This message allows the user to create new plan names. When this is done, a new word for that plan name must be placed in the vocabulary list along with the phrase template created through training. This will add the plan name only to the vocabulary list for this message. In other words, once trained the new plan name would only be known by this specific message vocabulary. Therefore, if ever implemented the voice system designed for TACFIRE should have the capability to place the new plan name, the associated voice pattern template, and the output string on all the vocabularies which will need the plan name.

### Support Function - User Commands

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	Plan Name	Cddt
11	Specified geometry name	Cddt
12	Erase plan name	Cddt
13	Erase specified geometry	Cddt
14	ABORT	Cddt
15	Erase abort	Cddt
16	Show nuc d	Cddt
17	Erase show nuc d	Cddt

18	Erase edit request	cdaddtXc
19	Erase edit request	cdaddt c
20	Erase print request	cdaddtXc
21	Erase print request	cdaddt c
22	Erase view request	cdaddtXc
23	Erase view request	cdaddt c
24	Show request	cdaddtXc
25	Erase show request	cdaddt c
26	Delete request	cdaddtXc
27	Do not delete	cdaddt c
28	Transmit request	cdaddtXc
29	Do not transmit	cdaddt c
30	Address see	cdaddt
31	Erase addressee	cdaddt
32	Zone of responsibility	cdaddtXc
33	Erase zone of responsibility	cdaddt c
34	Line of departure	cdaddtXc
35	Erase line of departure	cdaddt c
36	FEBA	cdaddtXc
37	Erase FEBA	cdaddt c
38	Air space coordination	cdaddtXc
39	Erase air space coordination	cdaddt c
40	Free fire area	cdaddtXc
41	Restrictive fire area	cdaddtXc
42	Erase restrictive fire area	cdaddt c
43	Restrictive fire line	cdaddtXc
44	Erase restrictive fire line	cdaddt c
45	Coordinated fire line	cdaddtXc
46	Erase coordinated fire line	cdaddt c
47	Dead space area	cdaddtXc
48	Erase dead space area	cdaddt c
49	Fire support coordination	cdaddtXc
50	Erase fire support	cdaddt c
51	Chemical hazard area	cdaddtXc
52	Erase chemical hazard area	cdaddt c
53	Damage avoidance area	cdaddtXc
54	Erase damage avoidance area	cdaddt c
55	Map mod indicator	cdaddtXc
56	Erase map mod indicator	cdaddt c
57	Check request	cdaddtXc
58	Erase check request	cdaddt c
59	Weapon descriptor table	cdaddtXc
60	Erase weapon descriptor	cdaddt c
61	1 0 5 millimeter	cdaddtT05MMrr
62	Mike 1 0 1	M101rrr
63	Mike 1 0 1 Alpha 1	M101A1r
64	Mike 1 0 2	M102rrr
65	Mike 1 0 8	M108rrr
66	1 5 5 millimeter	cdaddt155MMrr
67	Mike 1 0 9	M109rrr
68	Mike 1 0 9 Alpha 1	M109A1r
69	Mike 1 1 4 Alpha 1	M114A1r
70	Mike 1 1 4 Alpha 2	M114A2r
71	1 7 5 millimeter	cdaddt175MMrr
72	Mike 1 0 7	M107rrr
73	Mike 1 0 7 Echo 1	M107E1r
74	Eight Inch	cdaddt8INrrrr
75	Mike 1 1 0	M110rrr
76	Mike 1 1 0 Alpha 1	M110A1r
77	Mike 1 1 0 Alpha 2	M112A2r
78	Honest John	cdaddtHJrrrrM386rr
79	Lance	cdaddtLANCERRrr
80	Xray Mike 7 4 0	XM740rrr
81	Xray Mike 7 5 2	XM752rrr
82	Hercules	cdaddtHERCrrrrHERCrrr
83	M 9 1	cdaddtM91rrrrM91rrrr
84		





This concludes the description of the vocabulary necessary for the Support function. The Ammunition and Fire Unit function will be described next. The first message template is the Update fire unit message type which was described earlier as the sample message template. The vocabulary is exactly the same except for the few changes which are now possible because of the unlimited character output assumption.

Ammunition and Fire Unit Function - Update Fire Unit

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	Plan Name	cdt
11	Fire Unit	cdtt
12	1 0 5 millimeter	cdttt105MMt
13	Mike 1 0 1	M101c
14	Mike 1 0 1 Alpha 1	M101A1c
15	Mike 1 0 2	M102c
16	Mike 1 0 8	M108c
17	1 5 5 millimeter	cdttt155MMt
18	Mike 1 0 9	M109c
19	Mike 1 0 9 Alpha 1	M109A1c
20	Mike 1 1 4 Alpha 1	M114A1c
21	Mike 1 1 4 Alpha 2	M114A2c
22	1 7 5 millimeter	cdttt175MMt
23	Mike 1 0 7	M107c
24	Mike 1 0 7 Echo 1	M107E1c
25	Eight Inch	cdttt8INt
26	Mike 1 1 0	M110c
27	Mike 1 1 0 Alpha 1	M110A1c
28	Mike 1 1 0 Alpha 2	M112A2c
29	Honest John	cdtttHJtM386c
30	Lance	cdtttLANCt
31	Xray Mike 7 4 0	XM740c
32	Xray Mike 7 5 2	XM752c
33	Hercules	cdtttHERCtHERCC
34	M 9 1	cdtttM91tM91c
35	3 inch 50	cdttt3IN50t3IN50c
36	5 inch 38	cdttt5IN38t5IN38c
37	5 inch 54	cdttt5IN54t5IN54c
38	6 inch 47	cdttt6IN47t6IN47c
39	8 inch 55	cdttt8IN55t8IN55c
40	Foxtrot 4 Delta	cdtttF4DtF4Dc

41	Foxtrot	0	4	Echo	0000
42	Foxtrot	0	1	00	0000
43	Foxtrot	0	1	11	0000
44	Foxtrot	0	1	05	0000
45	Alpha	7		Charlie	0000
46	Alpha	7		Echo	0000
47	Alpha	4		Echo	0000
48	Alpha	4		Foxtrot	0000
49	Alpha	4		Mike	0000
50	Alpha	6		Alpha	0000
51	Alpha	6		Echo	0000
52	Alpha	10			0000
53	Foxtrot	4		Charlie	0000
54	Alpha	7		Delta	0000
55	Foxtrot	4		Bravo	0000
56	Foxtrot	4		Juliet	0000
57	General	Support			0000
58	Direct	Support			0000
59	General	Support	Reinforcing		0000
60	Reinforcing				0000
61	Coordinate	East			0000
62	Coordinate	North			0000
63	Altitude				0000
64	Grid	Zone			0000
65	Northern				0000
66	Southern				0000
67	Spheroid				0000
68	Ammunition				0000
69	High	Explosive			0000
70	Chemical				0000
71	Nuclear				0000
72	All	weapon types			0000
73	All	plans			0000
74	32	hundred mil sight			0000
75	64	hundred mil sight			0000
76	Bearing	sight			0000
77	Zone	of Responsibility			0000
78	Weapon	strength			0000
79	Azimuth				0000
80	Response	Time			0000
81	Cannon				0000
82	Missile	Rocket			0000
83	Air				0000
84	Navy				0000
85	Reinforced	Unit			0000
86	Force	supported			0000
87	Delete	request			0000
88	Fire	Unit Reaction Time			0000
89	Radiation				0000
90	Unit	ready			0000
91	Out	until			0000
92	Basic	Load			0000
93	Minimum	Range			0000
94	Gate	Time Group			0000
95	Cursor	reset			0000
96	Right				0000
97	Left				0000
98	Erase	Plan			0000
99	Erase	Unit			0000
100	Erase	weapon			0000
101	Erase	model			0000
102	Erase	mission			0000
103	Erase	ammunition			0000
104	Erase	sight			0000
105	Erase	zone			0000
106	Do	Not Delete			0000
107	Unit	Not ready			0000

Ammunition and Fire Unit Function - Ammunition Update

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	Plan Name	cdt
11	Fire Unit	cdtt
12	Erase plan name	cdt
13	Erase fire unit	cdtt
14	Ammunition received	cdtttXc
15	Erase ammunition received	cdttt_c
16	Ammunition expended	cdttttXc
17	Erase ammunition expended	cdtttt_c
18	Ammunition on hand	cdtttttXc
19	Erase ammunition on hand	cdttttt_c
20	projectile	cdttl
21	Fuze	cdtdtl
22	Mark	cdtddtl
23	Date time group	cdtdddt
24	Day	r
25	Hour	r
26	Minute	r
27	Right	r
28	Cursor reset	c

There is an entire table of valid shell types and fuze types which are legal entries in the "PROJ" and "FZES" field of the Ammunition Update message type. These can definitely be placed as words in the vocabulary list, but only the three letter mnemonics were given in the documentation. Therefore, it was not possible to develop a reasonable suggestion for the utterance without knowledge of what the mnemonic code stood for. If there are everyday standard references to the different shell and fuze types they should be added to the vocabulary list. For example, one fuze type is "HEA". It is possible to have the user say "H E A", but the recognition accuracy will be low since there is an "HEB" and an "HEC" etc. It is suggested that the utterance be

associated with the everyday reference to the mnemonic. The output string for the shells should be "rHEAr" to place the cursor in the proper position for the entry of the quantity subfield. The fuze output should be the same. For example, "PDA" should have an output of "rPDAr", and an appropriate spoken phrase to relate to the output string.

Ammunition and Fire Unit Function - Ammunition Level

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	Plan Name	cdt
11	Fire Unit	cdtt
12	Phrase plan name	cdt
13	Phrase fire unit	cdtt---77---c
14	Shells	cdtt---77---c
15	Fuzes	cdtt
16	Cursor reset	c

The same comments apply to the shell and fuze names as was stated for the Ammunition Update message type.

Ammunition and Fire Unit Function - Available Supply Rate

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	Plan Name	cdt
11	Fire Unit	cdtt
12	1 0 5 millimeter	cdttt105MMc
13	1 5 5 millimeter	cdttt155MMc

14	1 7 5 millimeter	cdtttt175MMc
15	Eight Inch	cdtttt8INC
16	Honest John	cdttttHJc
17	Lance	cdttttLANC
18	Perishing	cdttttPERSHC
19	Hercules	cdttttHERCC
20	M91	cdttttM91c
21	3 inch 50	cdtttt3IN50c
22	5 inch 38	cdtttt5IN38c
23	5 inch 54	cdtttt5IN54c
24	6 inch 47	cdtttt6IN47c
25	8 inch 55	cdtttt8IN55c
26	Foxtrot 4 Delta	cdttttF4DC
27	Foxtrot 4 Echo	cdttttF4EC
28	Foxtrot 100	cdttttF100c
29	Foxtrot 1 11	cdttttF111c
30	Foxtrot 1 0 5	cdttttF105c
31	Alpha 7 Charlie	cdttttA7CC
32	Alpha 7 Echo	cdttttA7EC
33	Alpha 4 Echo	cdttttA4EC
34	Alpha 4 Foxtrot	cdttttA4FC
35	Alpha 4 Mike	cdttttA4MC
36	Alpha 6 Alpha	cdttttA6AC
37	Alpha 6 Echo	cdttttA6EC
38	Alpha 10	cdttttA10c
39	Foxtrot 4 Charlie	cdttttF4CC
40	Alpha 7 Delta	cdttttA7DC
41	Foxtrot 4 Bravo	cdttttF4BC
42	Foxtrot 4 Juliet	cdttttF4JC
43	Erase plan name	cdtttt-----c
44	Erase fire unit	cdtttt77/___/___c
45	Erase weapon type	cdtttt-----c
46	Supply rate	cdtttt-----c
47	Cursor reset	c
48	Expanded amount	cdtttttt
49	Erase supply rate	cdtttt-----c
50	Erase expanded amount	cdtttt-----c
51	Perishing	cdttttPERSHC

Ammunition and Fire Unit Function - Nonnuclear mission

<u>word number</u>	<u>phrase spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	Target number	cdtt
11	Erase target number	cdtt-----c
12	Alpha	A
13	Bravo	B
14	Charlie	C
15	Delta	D
16	Echo	E
17	Foxtrot	F
18	Golf	G
19	Hotel	H
20	India	I

21	Juliet	J
22	Kilo	K
23	Lima	L
24	Mike	M
25	November	N
26	Oscar	O
27	Papa	P
28	Quebec	Q
29	Romeo	R
30	Sierra	S
31	Tango	T
32	Uniform	U
33	Victor	V
34	Whiskey	W
35	X-ray	X
36	Yankee	Y
37	Zulu	Z
38	Left	L
39	Right	R
40	Brass	B
41	Forward observer	FO
42	FO without laser	FWOLC
43	Observer not artillery	OBSNAC
44	Long range patrol	LRRPC
45	Target base	TGTBSC
46	Art observer	ARTOBSAC
47	Sound ranging	SORNRC
48	Flash ranging	FLRNRC
49	Counter mortar radar	CMRRRC
50	Counter battery radar	CBRRRC
51	Photo interpretation	PHINTC
52	Prisoner of war	POWC
53	Ground surveillance radar	GSRRAC
54	Side looking airborne radar	SLARAC
55	Airborne infrared	AIRIRC
56	Tactical air	TACAIRC
57	Communications intelligence	COMINTC
58	Electronic intelligence	ELINTC
59	Brass coordinating agency	-----C
60	Coordinate east	-----E
61	Coordinate north	-----N
62	Altitude	-----H
63	Grid zone	-----I
64	Cursor reset	-----R
65	Spheroid	-----S
66	Air defense artillery	ADAC
67	Armor	ARMORC
68	Artillery	ARTYIC
69	Assembly areas	ASSYIC
70	Building	BLDGCC
71	Bridge	BRIDGEC
72	Center	-----C
73	Equipment	EQUIPC
74	Mortars	MORTPC
75	Personnel	-----P
76	Rockets or Missiles	RKTMSLC
77	Special missions	SPECC
78	Supply dump	SUPPLYC
79	Maintain features	MAINTFC
80	Vehicle	-----V
81	Weapons	-----W
82	Unknown	-----U
83	Light	-----L
84	Medium	-----M
85	Heavy	-----H
86	Missile	-----M
87	Position	-----P





155	None	cdadddtttt	RONEC
156	None dug in	cdadddtttt	UGC
157	None overhead cover	cdadddtttt	PROVERC
158	Dug in	cdadddtttt	DUGINC
159	Under overhead cover	cdadddtttt	COVERC
160	Phrase degree of protection	cdadddtttt	-----C
161	Phrase target size	cdadddtttt	-----C
162	Phrase		
163	Cursor reset		
164	Attitude of target	cdadddtttt	
165	Strength of target	cdadddtttt	
166	Report value	cdadddtttt	
167	Excellent reliability	cdadddtttt	EC
168	Good reliability	cdadddtttt	GC
169	Fair reliability	cdadddtttt	FGC
170	Disposition neutralized	cdadddtttt	NEUTC
171	Disposition burning	cdadddtttt	BURNC
172	Burning and neutralized	cdadddtttt	NEUT/BUPNC
173	Target destroyed	cdadddtttt	DESTC
174	Can not observe	cdadddtttt	CNOC
175	Disposition unknown	cdadddtttt	UNKC
176	Disposition none	cdadddtttt	NONEC
177	Phrase disposition of target	cdadddtttt	-----C
178	Number of casualties	cdadddtttt	-----C
179	Date time group	cdadddtttt	
180	Day	rr	
181	Hour	rr	
182	Minute	rr	
183	Explain text	cdadddtttt	
184	Exclude target	cdadddtttt	Xc
185	Do not exclude target	cdadddtttt	_C
186	Fire unit one	cdadddtttt	
187	Fire unit two	cdadddtttt	
188	Fire unit three	cdadddtttt	
189	Shell type one	cdadddtttt	
190	Fuze type one	cdadddtttt	
191	Shell type two	cdadddtttt	
192	Fuze type two	cdadddtttt	
193	Shell type three	cdadddtttt	
194	Fuze type three	cdadddtttt	

Again the shell and fuze types have been left out of the vocabulary. The difference now is that this message type is slowly running out of the 256 word capacity associated with the Threshold 600. There are only 62 words left and it appears as if there are more than 60 shell and fuze descriptions. The phonetic alphabet was included to allow for the voice entry of the 2 alpha and 4 numeric target code number. This might be easier to put in by hand and thus save the 26 words needed for the alphabet. Without further information on shell and fuze possibilities a decision on this alternative could not be made.

Ammunition and Fire Unit Function - Nuclear Fire Mission

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	Target number	cdt
11	Erase target number	cdt _____c
12	Alpha	A
13	Bravo	B
14	Charlie	C
15	Delta	D
16	Echo	E
17	Foxtrot	F
18	Golf	G
19	Hotel	H
20	India	I
21	Juliett	J
22	Kilo	K
23	Lima	L
24	Mike	M
25	November	N
26	Oscar	O
27	Papa	P
28	Quebec	Q
29	Romeo	R
30	Sierra	S
31	Tango	T
32	Uniform	U
33	Victor	V
34	Whiskey	W
35	X ray	X
36	Yankee	Y
37	Zulu	Z
38	Left	L
39	Right	R
40	Erase	
41	Forward observer	cdttFOc
42	FO without laser	cdttFOWOLc
43	Observer not anti illeery	cdttOBSRC
44	Long range patrol	cdttLRPC
45	Target base	cdttTGTC
46	Air observer	cdttAOBSRC
47	Sound ranging	cdttSORNGC
48	Flash ranging	cdttFLRNGC
49	Counter mortar radar	cdttCMPRC
50	Counter battery radar	cdttCBRRc
51	Photo interpretation	cdttPIC
52	Prisoner of war	cdttPOWc
53	Ground surveillance radar	cdttGSRAC
54	Side looking airborne radar	cdttSLARC
55	Airborne infrared	cdttIRC
56	Practical air	cdttPACAIRc
57	Communications intelligence	cdttCOMINTc
58	Electronic intelligence	cdttELINTc
59	Erase originating agency	cdtt_____c
60	Coordinate east	cdtt_____c
61	Coordinate north	cdtt_____c



129	Persistent gas	cdatttccccccccGASPEA
130	Leaflets	cdatttccccccccLEAFc
131	Ammunition	cdatttccccccccAMMOc
132	Petroleum	cdatttccccccccPTLC
133	Bridge equipment	cdatttccccccccBRGEQC
134	Class one	cdatttccccccccCLIC
135	Class two	cdatttccccccccCLIC
136	Road	cdatttccccccccROADc
137	Junction	cdatttccccccccJCTC
138	Hill	cdatttccccccccHILLc
139	Defile	cdatttccccccccDEFILE
140	Landing strip	cdatttccccccccLDGSTR
141	Railroad	cdatttccccccccRRRc
142	Light wheeled	cdatttccccccccLTWHLc
143	Heavy wheeled	cdatttccccccccHVWHLc
144	Reconnaissance	cdatttccccccccRECONC
145	Boats	cdatttccccccccBTC
146	Aircraft	cdatttccccccccACFTc
147	Helicopter	cdatttccccccccHELIC
148	Light machine gun	cdatttccccccccLTMGC
149	Antitank gun	cdatttccccccccATGC
150	Heavy machine gun	cdatttccccccccHVMGC
151	Recoilless rifle	cdatttccccccccRCLRC
152	Erase target type	cdatttccccccccC
153	Erase target sub type	cdatttccccccccC
154	Half prone half standing	cdatttPRANDC-----
155	prone	cdatttPRONEc
156	prone dug in	cdatttPRUGC
157	prone overhead cover	cdatttPROVERc
158	Dug in	cdatttDUGINc
159	Under overhead cover	cdatttCOVERc
160	Erase degree of protection	cdattt-----c
161	Target size	cdattt-----
162	Erase	c
163	Cursor reset	c
164	Attitude of target	cdattttttt
165	Strength of target	cdattttttt
166	Report value	cdattt
167	Excellent reliability	cdatttEc
168	Good reliability	cdatttGc
169	Fair reliability	cdatttFc
170	Disposition neutralized	cdatttNEUTC
171	Disposition burning	cdatttBURNc
172	Burning and neutralized	cdatttNEUT/BURNc
173	Target destroyed	cdatttDESTc
174	Can not observe	cdatttCNOc
175	Disposition unknown	cdatttUNKc
176	Disposition none	cdatttNONEc
177	Erase disposition of target	cdattt-----c
178	Number of casualties	cdattttt-----c
179	Date time group	cdatttttt
180	Day	r
181	Hour	r
182	Minute	r
183	Plain text	cdatttttttt
184	Exclude target	cdattttttttXc
185	Fire unit	cdattt
186	Shell type	cdatttt
187	Fuze type	cdatttttt
188	Mark quantity	cdatttt

Ammunition and Fire Unit Function - Launch Site Update

Word number      Phrase Spoken      Output string

0	Zero			0
1	One			1
2	Two			2
3	Three			3
4	Four			4
5	Five			5
6	Six			6
7	Seven			7
8	Eight			8
9	Nine			9
10	Plan name			cd
11	Phrase plan name			cd
12	Delete request			cd
13	Do not delete			cd
14	Launch satellite one			cd
15	Launch satellite two			cd
16	Launch satellite three			cd
17	Launch satellite four			cd
18	Eight			8
19	Nine			9
20	Phrase			cd
21	Grid one one			cd
22	Grid one two			cd
23	Grid one three			cd
24	Grid one four			cd
25	Sphere one one			cd
26	Sphere one two			cd
27	Sphere one three			cd
28	Sphere one four			cd
29	Launch one one			cd
30	Launch one two			cd
31	Launch one three			cd
32	Launch one four			cd

Ammunition and Fire Unit Function - Build a Plan

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	Plan Name	cd
11	Fire Unit	cd
12	1 0 5 5 Millimeter	cd
13	1 5 5 5 Millimeter	cd
14	1 7 5 5 Millimeter	cd
15	Eight Inch	cd
16	Honest John	cd
17	Lance	cd
18	Hercules	cd
19	M 9 1	cd
20	3 3 1 1 Inch 50	cd
21	5 3 1 1 Inch 38	cd
22	5 5 1 1 Inch 54	cd
23	6 6 1 1 Inch 47	cd
24	8 1 1 1 Inch 55	cd
25	rocket 4 Delta	cd

26	Foxtrot	4	Echo	cdtttt	F4EC
27	Foxtrot	100		cdtttt	F100C
28	Foxtrot	1	11	cdtttt	F111C
29	Foxtrot	1	0 5	cdtttt	F105C
30	Alpha	7	Charlie	cdtttt	A7CC
31	Alpha	7	Echo	cdtttt	A7EC
32	Alpha	4	Echo	cdtttt	A4EC
33	Alpha	4	Foxtrot	cdtttt	A4FC
34	Alpha	4	Mike	cdtttt	A4MC
35	Alpha	6	Alpha	cdtttt	A6AC
36	Alpha	6	Echo	cdtttt	A6EC
37	Alpha	10		cdtttt	A10C
38	Foxtrot	4	Charlie	cdtttt	F4CC
39	Alpha	7	Delta	cdtttt	A7DC
40	Foxtrot	4	Bravo	cdtttt	F4BC
41	Foxtrot	4	Juliet	cdtttt	F4JC
42	Pershing			cdtttt	PERSHC
43	High explosive			cdtttt	HEHC
44	Chemical			cdtttt	CHC
45	Nuclear			cdtttt	NUC
46	Erase ammunition type			cdtttt	__C
47	New plan name			cdtt	
48	Erase plan name			cdtt	
49	Erase fire unit			cdtttt	77/_/_/_/___C

Ammunition and Fire Unit Function - User Commands

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Check request	cdttXc
1	Erase check request	cdttc
2	Edit request	cdttXc
3	Erase edit request	cdttc
4	Print request	cdttXc
5	Erase print request	cdttc
6	View request	cdttXc
7	Erase view request	cdttc
8	Show request	cdttXc
9	Erase show request	cdttc
10	Plan Name	cdt
11	Fire Unit	cdtt
12	1 0 5 millimeter	cdttt 105MMc
13	1 5 5 millimeter	cdttt 155MMc
14	1 7 5 millimeter	cdttt 175MMc
15	Eight Inch	cdttt 8INC
16	Honest John	cdttt HJc
17	Lance	cdttt LANCeC
18	Hercules	cdttt HERCc
19	M 9 1	cdttt M91c
20	3 inch 50	cdttt 3IN50c
21	5 inch 38	cdttt 5IN38c
22	50 inch 54	cdttt 50IN54c
23	6 inch 47	cdttt 6IN47c
24	8 inch 55	cdttt 8IN55c
25	Foxtrot 4 Delta	cdtttt F4Dc
26	Foxtrot 4 Echo	cdtttt F4Ec
27	Foxtrot 100	cdtttt F100C
28	Foxtrot 1 11	cdtttt F111C
29	Foxtrot 1 0 5	cdtttt F105C
30	Alpha 7 Charlie	cdtttt A7CC
31	Alpha 7 Echo	cdtttt A7EC
32	Alpha 4 Echo	cdtttt A4EC
33	Alpha 4 Foxtrot	cdtttt A4FC
34	Alpha 4 Mike	cdtttt A4MC



35	Personnel	cddddtPERSr
36	Rockets or Missiles	cddddtRKTMSLr
37	Special missions	cddddtSPECr
38	Supply dump	cddddtSUPPLYr
39	Terrain features	cddddtTERr
40	Vehicle	cddddtVEHr
41	Weapons	cddddtWPNR
42	Air defense artillery	cddddtADAr
43	Armor	cddddtARMORr
44	Erase material destroyed	cdddt_____/c

The unit which sends this message should have one more word which is the identifier for their unit. This will be placed in the field labeled "A". The output should look as follows "cdt??/???c" where the "?" are replaced by the unit identifier.

This concludes the presentation of the message types for the Ammunition and Fire Unit function. The next section will cover the Meteorological Function.

#### Meteorological Function - MET Computer

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	Octant	cdt
11	position	cdtt
12	right	r
13	left	l
14	Erase	
15	Valid time period	cdttt
16	Height of station	cdtttt
17	Atmospheric pressure	cdttttt

The octant field uses numeric codes for the various octants in which the global coordinates have been divided for TACFIRE. Numerous phrases were tested to establish an



easy to remember and easy to say phrase to represent the octants. None of the possibilities was acceptable. Therefore, this field will be filled by saying the numeric code zero through eight. Hopefully, the individuals entering the meteorological data are familiar enough with their specialty that this will make little difference in the efficiency of voice input for this message type.

This message also requires a heavy numeric data input. Each of the fields which were not listed in the vocabulary have numerous subfields for all 20 altitude levels in which meteorological data is collected. To efficiently input this type of information through voice data entry, a continuous speech recognizer would most definitely be needed. This applies to the next meteorological message type too.

Meteorological Function - MET Fallout

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	Octant	0dt
11	position	0dtt
12	Right	1
13	Left	1
14	Phrase	1
15	Valid time period	0dttt
16	Height of station	0dtttt

Meteorological Function - Forecast

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4

5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	Date time group	dat
11	Day	day
12	Hour	hour
13	Minute	min
14	Length	length
15	Weight	weight
16	Phrase	phrase
17	Valid time period	valid
18	Coordinate east	coord
19	Coordinate north	coord
20	Altitude	alt
21	Grid zone	grid
22	Cursor reset	cursor
23	Spheroid	spheroid
24	Wind	wind
25	Lapse	lapse
26	Neutral	neutral
27	Inverted	inverted
28	Temperature	temp
29	Relative humidity	humidity
30	Light rain	light
31	Moderate rain	moderate
32	Heavy rain	heavy
33	Light snow	light
34	Moderate snow	moderate
35	Heavy snow	heavy
36	Clean	clean
37	Scattered clouds	scattered
38	Clouds broken	clouds
39	Overcast	overcast
40	Low clouds	low
41	Medium clouds	medium
42	High clouds	high

Meteorological Function - User Commands

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	edit request	edit XC
11	phrase edit request	edit c
12	print request	print XC
13	phrase print request	print c
14	transmit request	transmit XC
15	phrase transmit request	transmit c
16	Destination address see	destination
17	phrase addressee	addressee
18	Delete request	delete XC
19	Do not delete	delete c
20	Line designator	line

21	Grid	d	Cl	a	r	a	t	i	o	n		0
22	Current	met	info	at								000
23	Phrase	carrier	met	at								000
24	Fallout	indicator	at									000
25	Phrase	fallout	indicator									000
26	Forecast	indicator	at									000
27	Phrase	fallout	indicator									000
28	Date	time	group									000
29	Day											000
30	Hour											000
31	Minute											000
32	Right											000
33	Left											000
34	Phrase											000
35	Cursor	reset										0

This completes the Meteorological Function vocabularies. The next section will cover the vocabularies needed for the Tactical Fire Control Function.

Tactical Fire Control Function - Request for Additional Fire

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	Target number	0000
11	Phrase target number	0000
12	Alpha	A
13	Bravo	B
14	Charlie	C
15	Delta	D
16	Echo	E
17	Foxtrot	F
18	Golf	G
19	Hotel	H
20	India	I
21	Juliett	J
22	Kilo	K
23	Lima	L
24	Mike	M
25	November	N
26	Oscar	O
27	Papa	P
28	Quebec	Q
29	Romeo	R
30	Sierra	S
31	Tango	T

32	U n i f o r m	U
33	V i c t o r	V
34	W h i s k e y	W
35	X r a y	X
36	Y a n k e e	Y
37	Z u l u	Z
38	L e f t	N
39	R i g h t	L
40	E r a s e	E
41	R e q u e s t f o r f i r e	Q
42	E r a s e r e q u e s t f o r f i r e	Q
43	O b s e r v e r t o t a r g e t d i r e c t i o n	Q
44	C o o r d i n a t e e a s t	Q
45	C o o r d i n a t e n o r t h	Q
46	A l t i t u d e	Q
47	G r i d z o n e	Q
48	S p h e r o i d	Q
49	T a r g e t r a d i u s	Q
50	T a r g e t l e n g t h	Q
51	T a r g e t w i d t h	Q
52	A t t i t u d e	Q
53	S t r e n g t h o f t a r g e t	Q
54	R e p o r t v a l u e	Q
55	I n i t i a l s p e l l t y p e	Q
56	S u b s e q u e n t s h e l l t y p e	Q
57	I n i t i a l f u z e t y p e	Q
58	S u b s e q u e n t f u z e t y p e	Q
59	D a t e t i m e g r o u p	Q
60	D a y	H
61	H o u r	H
62	M i n u t e	H
63	T i m e o n t a r g e t	Q
64	C u r s o r r e s e t	C
65	F i n e u n i t s	Q
66	A i r d e f e n s e a r t i l l e r y	Q
67	A r m o r	Q
68	A r t i l l e r y	Q
69	A s s e m b l y a r e a s	Q
70	B u i l d i n g	Q
71	B r i d g e	Q
72	C e n t e r	Q
73	E q u i p m e n t	Q
74	M o r t a r s	Q
75	P e r s o n n e l	Q
76	R o c k e t s o r M i s s i l e s	Q
77	S p e c i a l m i s s i o n s	Q
78	S u p p l y d u m p	Q
79	T e r r a i n f e a t u r e s	Q
80	V e h i c l e	Q
81	W e a p o n s	Q
82	U n k n o w n	Q
83	L i g h t	Q
84	M e d i u m	Q
85	H e a v y	Q
86	M i s s i l e	Q
87	P o s i t i o n	Q
88	A r m o r e d p e r s o n n e l c a r r i e r	Q
89	T r o o p s	Q
90	T r o o p s a n d v e h i c l e s	Q
91	M e c h a n i z e d t r o o p s	Q
92	W o o d	Q
93	M a s o n r y	Q
94	C o n c r e t e	Q
95	M e t a l	Q
96	S p e c i a l p u r p o s e	Q
97	F o o t p o n t o o n	Q
98	V e h i c l e p o n t o o n	Q

99	Steele	CC	STEE	LC
100	Steele	CC	STEE	LC
101	Steele	CC	STEE	LC
102	Steele	CC	STEE	LC
103	Small	CC	SMALL	LC
104	Battalion	CC	BATT	LC
105	Regiment	CC	REGT	LC
106	Division	CC	DIVD	LC
107	Forward	CC	FORW	LC
108	Radar	CC	RADA	RC
109	Electronic warfare	CC	ELEC	RC
110	Searchlight	CC	SEAR	LC
111	Guidance	CC	GUID	LC
112	Loudspeaker	CC	LOUD	LC
113	Very heavy	CC	VERY	LC
114	Infantry	CC	INFA	LC
115	Observation post	CC	OBSV	LC
116	Patrol	CC	PATR	LC
117	Work party	CC	WOPR	LC
118	Anti personnel	CC	ANTI	LC
119	Light missile	CC	LIGHT	LC
120	Medium missile	CC	MEDI	LC
121	Heavy missile	CC	HEAV	LC
122	Anti tank	CC	ANTI	LC
123	Illumination one gun	CC	ILLU	LC
124	Illumination two guns	CC	ILLU	LC
125	Illumination with deflection	CC	ILLU	LC
126	Illumination with range	CC	ILLU	LC
127	Illumination four guns	CC	ILLU	LC
128	Nonpersistent gas	CC	NONP	LC
129	Persistent gas	CC	PERS	LC
130	Leaflets	CC	LEAF	LC
131	Ammunition	CC	AMMO	LC
132	Petroleum	CC	PETE	LC
133	Bridge equipment	CC	BRID	LC
134	Class one	CC	CLAS	LC
135	Class two	CC	CLAS	LC
136	Road	CC	ROAD	LC
137	Junction	CC	JUNC	LC
138	Hill	CC	HILL	LC
139	Defile	CC	DEFI	LC
140	Landing strip	CC	LAND	LC
141	Railroad	CC	RAIL	LC
142	Light wheeled	CC	LIGHT	LC
143	Heavy wheeled	CC	HEAV	LC
144	Reconnaissance	CC	RECO	LC
145	Boats	CC	BOAT	LC
146	Aircraft	CC	ACFT	LC
147	Helicopter	CC	HELI	LC
148	Light machine gun	CC	LIGHT	LC
149	Anti tank gun	CC	ANTI	LC
150	Heavy machine gun	CC	HEAV	LC
151	Recoilless rifle	CC	RECO	LC
152	Base target type	CC	BASE	LC
153	Base target sub	CC	BASE	LC
154	Base phone barrier standing	CC	BASE	LC
155	Phone	CC	PHONE	LC
156	Phone dug in	CC	PHONE	LC
157	Phone over head cover	CC	PHONE	LC
158	Dug in	CC	DUGI	LC
159	Under over head cover	CC	UNDER	LC
160	Base degree of protection	CC	BASE	LC
161	Base fire unit	CC	BASE	LC
162	Save fire unit	CC	SAVE	LC
163	When ready	CC	WHEN	LC
164	At my command	CC	ATMY	LC
165	Fire per effect	CC	FIRE	LC

156	Repeat fire for effect	00000000000000000000000000000000
167	Desired fire effects	00000000000000000000000000000000
168	Desired volleys	00000000000000000000000000000000
169	End of mission	00000000000000000000000000000000
170	Erase end of mission	00000000000000000000000000000000
171	Add data	00000000000000000000000000000000
172	Alter data	00000000000000000000000000000000
173	Delete data	00000000000000000000000000000000
174	Mission number one	00000000000000000000000000000000
175	Mission number two	00000000000000000000000000000000
176	Urgent priority	00000000000000000000000000000000
177	Priority	00000000000000000000000000000000
178	Observer's identity number	00000000000000000000000000000000
179	Additional text	00000000000000000000000000000000

As in previous fire mission messages the shell and fuze types have not been included in the vocabulary, but would need to be developed to create the message totally through voice input.

The unit names must also be added to the vocabulary list. Since the message template allows the input of a serial string of fire unit names the output for each possible unit should be in the form "?/?/?/?/?/?r". This would allow unit designators to be serially listed in the unit fifth line of the message template. To facilitate the serial list there are two phrases listed in the above vocabulary. These phrases, "save unit" and "erase unit" can be used to move across the fire unit line to any specific unit and easily erase it from the line.

Tactical Fire Control Function - Criteria Modifications

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	Date time group	cdt
11	Day	r

12	Hour	hh
13	Minute	mm
14	Zone of responsibility	cccc
15	Delete request	ccccXc
16	Do not delete	ccccC
17	Ignore ammunition designation	ccccXcC
18	Ignore ammunition designation	ccccC
19	Direct cutoff factor	cccc
20	Maximum number of battalions	cccc

Tactical Fire Control Function - Fire unit exclusion

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	Delete request	ccccXc
11	Do not delete	ccccC
12	1 0 5 5 millimeter	cccc1055MMc
13	1 5 5 5 millimeter	cccc1555MMc
14	1 7 5 5 millimeter	cccc1755MMc
15	Eight Inch	cccc8INc
16	Honest John	ccccHJC
17	Lance	ccccLANc
18	Vershing	ccccPERSHC
19	Hercules	ccccHERCc
20	M 9 1	ccccM91c
21	3 1/2 inch 50	cccc3IN50c
22	5 1/2 inch 38	cccc5IN38c
23	5 1/2 inch 54	cccc5IN54c
24	5 1/2 inch 47	cccc5IN47c
25	3 1/2 inch 55	cccc3IN55c
26	Foxtrot 4 Delta	cccc4Dc
27	Foxtrot 4 Echo	cccc4Ec
28	Foxtrot 100	cccc100c
29	Foxtrot 1 11	cccc111c
30	Foxtrot 1 0 5	cccc105c
31	Alpha 7 Charlie	ccccA7Cc
32	Alpha 7 Echo	ccccA7Ec
33	Alpha 4 Echo	ccccA4Ec
34	Alpha 4 Foxtrot	ccccA4Fc
35	Alpha 4 Mike	ccccA4Mc
36	Alpha 6 Alpha	ccccA6Ac
37	Alpha 6 Echo	ccccA6Ec
38	Alpha 10	ccccA10c
39	Foxtrot 4 Charlie	cccc4Ccc
40	Alpha 7 Delta	ccccA7Dcc
41	Foxtrot 4 Bravo	cccc4Bcc
42	Foxtrot 4 Juliet	cccc4Jc
43	Date time group	cccc
44	Day	hh
45	Hour	hh
46	Minute	mm
47	Fire units	cccc
48	Save fire unit	hhhhhhhhhh
49	Erase fire unit	///_/_/_/_/_/_/_

50	Shell type	000000
51	Fuze type	000000
52	Base shell type	000000
53	Save this shell	000000
54	Base fuze type	000000
55	Save this fuze	000000

Tactical Fire Control Function - Fire unit selection

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	Delete request	000000 X0
11	Do not delete	000000 C
12	1 0 5 millimeter	000000 105 MMC
13	1 5 5 millimeter	000000 155 MMC
14	1 7 5 millimeter	000000 175 MMC
15	Eight Inch	000000 8 IN C
16	Honest John	000000 HJ C
17	Lance	000000 LANCE C
18	Pershing	000000 PERSH C
19	Hercules	000000 HERC C
20	M 9 1	000000 M9 1 C
21	3 inch 50	000000 3 IN 50 C
22	5 inch 38	000000 5 IN 38 C
23	5 inch 54	000000 5 IN 54 C
24	6 inch 47	000000 6 IN 47 C
25	8 inch 55	000000 8 IN 55 C
26	Foxtrot 4 Delta	000000 4 D C
27	Foxtrot 4 Echo	000000 4 E C
28	Foxtrot 100	000000 100 C
29	Foxtrot 1 11	000000 1 11 C
30	Foxtrot 1 0 5	000000 1 0 5 C
31	Alpha 7 Charlie	000000 A7 C
32	Alpha 7 Echo	000000 A7 E C
33	Alpha 4 Echo	000000 A4 E C
34	Alpha 4 Foxtrot	000000 A4 F C
35	Alpha 4 Mike	000000 A4 M C
36	Alpha 6 Alpha	000000 A6 A C
37	Alpha 6 Echo	000000 A6 E C
38	Alpha 10	000000 A 10 C
39	Foxtrot 4 Charlie	000000 4 C C
40	Alpha 7 Delta	000000 A7 D C
41	Foxtrot 4 Bravo	000000 4 B C
42	Foxtrot 4 Juliet	000000 4 J C
43	Date time group	000000
44	Day	000000
45	Hour	000000
46	Minute	000000
47	Fire units	000000
48	Save fire unit	000000
49	Base fire unit	000000
50	Battalion order number	000000
51	Maximum volleys	000000
52	Fire unit ordering	000000



The remaining vocabulary words will be made up of unit names and battalion names if desired.

Tactical Fire Control Function - Attack Method

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	Date time group	Gdt
11	Day	H
12	Hour	H
13	Minute	H
14	Delete request	cdttxc
15	Do not delete	cdttxc
16	Desired effects	cdttxc
17	Desired volley factor	cdttxc
18	Cursor reset	C
19	Left	L
20	Air defense artillery	cdttxcADAc
21	Armor	cdttxcARMORC
22	Artillery	cdttxcARTYc
23	Assembly areas	cdttxcASSYc
24	Building	cdttxcBLDGc
25	Bridge	cdttxcBRIDGEC
26	Center	cdttxcCENC
27	Equipment	cdttxcEQUIPc
28	Mortars	cdttxcMORTC
29	Personnel	cdttxcPERSC
30	Rockets or Missiles	cdttxcRKKTMSLc
31	Special missions	cdttxcSPECc
32	Supply dump	cdttxcSUPPLYc
33	Terrain features	cdttxcTERRc
34	Vehicle	cdttxcVEHC
35	Weapons	cdttxcWFMC
36	Unknown	cdttxcUNKc
37	Light	cdttxcLTC
38	Medium	cdttxcMDMC
39	Heavy	cdttxcHVC
40	Missile	cdttxcMSLc
41	Position	cdttxcPOS
42	Armored personnel carrier	cdttxcAPC
43	Troops	cdttxcTRC
44	Troops and vehicles	cdttxcTRVHC
45	Mechanized troops	cdttxcTRMHC
46	Wood	cdttxcWOODc
47	Masonry	cdttxcMASONRYc
48	Concrete	cdttxcCONC
49	Metal	cdttxcMETC
50	Special purpose	cdttxcSPTC
51	Foot pontoon	cdttxcFPONc
52	Vehicle pontoon	cdttxcVEHPONc
53	Steel	cdttxcSTELc
54	Site	cdttxcSITEc

55	Raft	CC	RAFC
56	Reentry	CC	RAYC
57	Small	CC	SMALLC
58	Battalion	CC	BNC
59	Regiment	CC	REGTC
60	Division	CC	DIVC
62	Forward	CC	FWDC
63	Radar	CC	RADARC
64	Electronic warfare	CC	EWEC
65	Searchlight	CC	SLTC
66	Guidance	CC	GDMCC
67	Loudspeaker	CC	LSC
68	Very heavy	CC	VHC
69	Infantry	CC	INFC
70	Observation post	CC	OPC
71	Patrol	CC	PTLC
72	Work party	CC	WKPTYC
73	Anti personnel	CC	APERSC
74	Light missile	CC	LTMSLC
75	Medium missile	CC	MDMSLC
76	Heavy missile	CC	HVMSLC
77	Anti tank	CC	ATANKC
78	Illumination one gun	CC	ILL1C
79	Illumination two guns	CC	ILL2C
80	Illumination with deflection	CC	ILL2DFC
81	Illumination with range	CC	ILL2RGC
92	Illumination four guns	CC	ILL4C
83	Nonpersistent gas	CC	GASNONC
84	persistent gas	CC	GASPERC
85	Leaflets	CC	LEAFC
86	Ammunition	CC	AMMOC
87	Petroleum	CC	PETLC
88	Bridge equipment	CC	BRGEQC
89	Class one	CC	CL1C
90	Class two	CC	CL2C
91	Road	CC	ROADC
92	Junction	CC	JCTC
93	Hill	CC	HILLC
94	Defile	CC	DEFILC
95	Landing strip	CC	LDGSTRC
96	Railroad	CC	RRC
97	Light wheeled	CC	LTWHLC
98	Heavy wheeled	CC	HVWHLC
99	Reconnaissance	CC	RECONC
100	Boats	CC	BTC
101	Aircraft	CC	ACFTC
102	Helicopter	CC	HELIC
103	Light machine gun	CC	LTMG
104	Anti tank gun	CC	ATMG
105	Heavy machine gun	CC	HVMG
106	Recoilless rifle	CC	RCLRC
107	Erase target type	CC	ERASEC
108	Erase target sub type	CC	ERASEC
109	Half prone half standing	CC	PRANDC
110	prone	CC	PRONC
111	prone dug in	CC	PRUGC
112	prone overhead cover	CC	PROVERC
113	Dug in	CC	DUGINC
114	Under overhead cover	CC	COVERC
115	Erase degree of protection	CC	ERASEC

Tactical Fire Control Function - User commands

Word number      Phrase Spoken      Output string

0	Z	
1	O	
2	N	
3	F	
4	E	
5	T	
6	I	
7	O	
8	S	
9	I	
10	H	number
11	A	target number
12	M	
13	H	
14	O	
15	C	
16	H	
17	O	
18	G	
19	H	
20	H	
21	C	
22	N	
23	L	
24	I	
25	M	
26	O	
27	V	
28	O	
29	S	
30	I	
31	H	
32	V	
33	I	
34	W	
35	X	
36	Y	
37	N	
38	I	
39	H	
40	F	
41	H	
42	H	
43	O	
44	H	
45	D	
46	D	
47	H	
48	H	
49	H	
50	H	
51	H	
52	H	
53	H	
54	H	
55	H	
56	H	

Tactical Fire Control Function - Capability Analysis

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0

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One  
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Three  
Four  
Five  
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Seven  
Eight  
Nine  
Target number  
Erase target number  
Alpha  
Bravo  
Charlie  
Delta  
Echo  
Foxrot  
Golf  
Hotel  
India  
Juliet  
Kilo  
Lima  
Mike  
November  
Oscar  
Papa  
Quebec  
Romeo  
Sierra  
Tango  
Uniform  
Victor  
Whiskey  
Xray  
Yankee  
Zulu  
Eight  
Erase  
Plan name  
Erase subtype  
Erase unit  
Coordinate east  
Coordinate north  
Altitude  
Grid zone  
Spheroid  
Target radius  
Target length  
Target width  
Erase unit  
Erase plan name  
Erase type  
Initial shell type  
Subsequent shell type  
Initial fuze type  
Subsequent fuze type  
Date time group  
Day  
Hour  
Minute  
Erase degree of protection  
Cursor reset  
Erase weapon type  
Air defense artillery  
Armor

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68	Artillery	CC	AA	SS	YY	CC
69	Assault areas	CC	BB	SS	YY	CC
70	Buildings	CC	BB	DD	GG	CC
71	Buildings	CC	BB	DD	GG	EE
72	Canteen	CC	CC	CC	CC	CC
73	Equipment	CC	CC	CC	CC	CC
74	Mountains	CC	CC	CC	CC	CC
75	Personnel	CC	CC	CC	CC	CC
76	Rocket missiles	CC	CC	CC	CC	CC
77	Special Missions	CC	CC	CC	CC	CC
78	Supply dump	CC	CC	CC	CC	CC
79	Terrain features	CC	CC	CC	CC	CC
80	Vehicle	CC	CC	CC	CC	CC
81	Weapons	CC	CC	CC	CC	CC
82	Unknown	CC	CC	CC	CC	CC
83	Light	CC	CC	CC	CC	UNKC
84	Medium	CC	CC	CC	CC	MDMC
85	Heavy	CC	CC	CC	CC	HVVC
86	Missile	CC	CC	CC	CC	MSLC
87	Position	CC	CC	CC	CC	OSCC
88	Armored personnel carrier	CC	CC	CC	CC	APCC
89	Troops	CC	CC	CC	CC	TRCC
90	Troops and vehicles	CC	CC	CC	CC	TRVHC
91	Mechanized troops	CC	CC	CC	CC	TRARMCC
92	Wood	CC	CC	CC	CC	WOODCC
93	Masonry	CC	CC	CC	CC	MASNYCC
94	Concrete	CC	CC	CC	CC	CONCC
95	Metal	CC	CC	CC	CC	METCC
96	Special purpose	CC	CC	CC	CC	SPCC
97	Foot pontoon	CC	CC	CC	CC	FPONCC
98	Vehicle pontoon	CC	CC	CC	CC	VEHPONCC
99	Steel	CC	CC	CC	CC	STELCC
100	Structure	CC	CC	CC	CC	STRUC
101	Hard	CC	CC	CC	CC	HARDCC
102	Ferry	CC	CC	CC	CC	FERRYCC
103	Small	CC	CC	CC	CC	SMALLCC
104	Battalion	CC	CC	CC	CC	BATTCC
105	Requirement	CC	CC	CC	CC	REQCC
106	Division	CC	CC	CC	CC	DIVCC
107	Forward	CC	CC	CC	CC	FWDC
108	Radar	CC	CC	CC	CC	RADARCC
109	Electronic warfare	CC	CC	CC	CC	EWC
110	Searchlight	CC	CC	CC	CC	SLTCC
111	Guidance	CC	CC	CC	CC	GDNCC
112	Loudspeaker	CC	CC	CC	CC	LSCCC
113	Very heavy	CC	CC	CC	CC	VHCC
114	Infantry	CC	CC	CC	CC	INFCC
115	Observation post	CC	CC	CC	CC	OPCC
116	Patrol	CC	CC	CC	CC	PATCC
117	Work party	CC	CC	CC	CC	WKPTCC
118	Anti personnel	CC	CC	CC	CC	APBSCC
119	Light missile	CC	CC	CC	CC	LTMSSCC
120	Medium missile	CC	CC	CC	CC	MDMSSCC
121	Heavy missile	CC	CC	CC	CC	HVMSSCC
122	Anti tank	CC	CC	CC	CC	ATANKCC
123	Illumination one gun	CC	CC	CC	CC	ILL1CC
124	Illumination two guns	CC	CC	CC	CC	ILL2CC
125	Illumination with range	CC	CC	CC	CC	ILL2RCC
126	Illumination with range	CC	CC	CC	CC	ILL2RGC
127	Illumination four guns	CC	CC	CC	CC	ILL4CC
128	Nonpersistent gas	CC	CC	CC	CC	GASNONCC
129	Persistent gas	CC	CC	CC	CC	GASPERCC
130	Leaflets	CC	CC	CC	CC	LEAFCC
131	Ammunition	CC	CC	CC	CC	AMMCC
132	Retrolum	CC	CC	CC	CC	RETCC
133	Bridge equipment	CC	CC	CC	CC	BRIDGECC
134	Class one	CC	CC	CC	CC	CL1CC

135	Class two	cdttdt	CLITC
136	Road	cdttdt	ROADC
137	Junction	cdttdt	JCTC
138	Hill	cdttdt	HILLC
139	Defile	cdttdt	DEFILE
140	Landing strip	cdttdt	LDGSTR
141	Railroad	cdttdt	RRRC
142	Light wheeled	cdttdt	LTWHLc
143	Heavy wheeled	cdttdt	HVWHLC
144	Reconnaissance	cdttdt	RECONC
145	Boats	cdttdt	BTC
146	Aircraft	cdttdt	ACFTc
147	Helicopter	cdttdt	HELc
148	Light machine gun	cdttdt	LTMGC
149	Antitank gun	cdttdt	ATGC
150	Heavy machine gun	cdttdt	HVMGC
151	Recoilless rifle	cdttdt	RCLRC
152	Erase date time group	cdttdt	---/---/---c
153	Erase sphere	cdttdt	c
154	Half prone half standing	cdttdt	PRANDC
155	prone	cdttdt	PRONEC
156	prone dug in	cdttdt	PRUGC
157	prone overhead cover	cdttdt	PROVERC
158	Dug in	cdttdt	DUGINC
159	Under overhead cover	cdttdt	COVERC
160	1 0 5 millimeter	cdttdt	105MMc
161	1 5 5 millimeter	cdttdt	155MMc
162	1 7 5 millimeter	cdttdt	175MMc
163	Eight Inch	cdttdt	8INC
164	Honest John	cdttdt	HJc
165	Lance	cdttdt	LANCERC
166	Hercules	cdttdt	HERCc
167	M 9 1	cdttdt	M91c
168	3 inch 50	cdttdt	3IN50c
169	5 inch 38	cdttdt	5IN38c
170	5 inch 54	cdttdt	5IN54c
171	6 inch 47	cdttdt	6IN47c
172	8 inch 55	cdttdt	8IN55c
173	Foxtrot 4 Delta	cdttdt	F4Dc
174	Foxtrot 4 Echo	cdttdt	F4Ec
175	Foxtrot 100	cdttdt	F100c
176	Foxtrot 1 11	cdttdt	F111c
177	Foxtrot 1 0 5	cdttdt	F105c
178	Alpha 7 Charlie	cdttdt	A7Cc
179	Alpha 7 Echo	cdttdt	A7Ec
180	Alpha 4 Echo	cdttdt	A4Ec
181	Alpha 4 Foxtrot	cdttdt	A4Fc
182	Alpha 4 Mike	cdttdt	A4Mc
183	Alpha 6 Alpha	cdttdt	A6Ac
184	Alpha 6 Echo	cdttdt	A6Ec
185	Alpha 10	cdttdt	A10c
186	Foxtrot 4 Charlie	cdttdt	F4Cc
187	Alpha 7 Delta	cdttdt	A7Dc
188	Foxtrot 4 Bravo	cdttdt	F4Bc
189	Foxtrot 4 Juliet	cdttdt	F4Jc

Tactical Fire Control Function - Forward Observer Command

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3

4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	Target number	0d
11	Erase target number	0d
12	Alpha	0d
13	Bravo	0d
14	Charlie	0d
15	Delta	0d
16	Echo	0d
17	Foxrot	0d
18	Golf	0d
19	Hotel	0d
20	India	0d
21	Juliet	0d
22	Kilo	0d
23	Lima	0d
24	Mike	0d
25	November	0d
26	Oscar	0d
27	Papa	0d
28	Quebec	0d
29	Romeo	0d
30	Sierra	0d
31	Tango	0d
32	Uniform	0d
33	Victor	0d
34	Whiskey	0d
35	X ray	0d
36	Yankee	0d
37	Zulu	0d
38	Left	0d
39	Right	0d
40	Erase	0d
41	Check fire all	0d+CHKALLc
42	Check firing	0d+CKFIREc
43	Command to fire	0d+FIREc
44	Observer identity number	0d
45	Cursor reset	0

Tactical Fire Control Function - Subsequent Commands

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	Target number	0d
11	Erase target number	0d
12	Alpha	0d
13	Bravo	0d
14	Charlie	0d
15	Delta	0d
16	Echo	0d





84	Medium	CC	DMC
85	Heavy	CC	VC
86	Missile	CC	SLC
87	Position	CC	OSCC
88	Armored personnel carrier	CC	CCC
89	Troops	CC	CCC
90	TROOPS and vehicles	CC	VEHC
91	Mechanized troops	CC	PARMC
92	Wood	CC	WOODC
93	Masonry	CC	MASNYC
94	Concrete	CC	CONCC
95	Metal	CC	METC
96	Special purpose	CC	SPEC
97	Food pontoon	CC	FOONC
98	Vehicle pontoon	CC	VEHPONC
99	Site	CC	SITC
100	Site	CC	SITC
101	Site	CC	SITC
102	Ferry	CC	FERRYC
103	Small	CC	SMALLC
104	Battalion	CC	BATT
105	Requirement	CC	REQTC
106	Division	CC	DIVVC
107	Forward	CC	FORWC
108	Radar	CC	RADARC
109	Electronic warfare	CC	ELEWAR
110	Searchlight	CC	SEARHC
111	Guidance	CC	GUIDC
112	Loudspeaker	CC	LOUDC
113	Very heavy	CC	VEVHC
114	Instantly	CC	INSTC
115	Observation post	CC	OBSPOST
116	Patrol	CC	PATROL
117	Work party	CC	WORKC
118	Assignment	CC	ASSTC
119	Light missile	CC	LIGHTC
120	Medium missile	CC	MEDC
121	Heavy missile	CC	HEAVC
122	Antitank	CC	ANTI
123	Illumination one gun	CC	ILL1C
124	Illumination two guns	CC	ILL2C
125	Illumination with deflection	CC	ILL2DFC
126	Illumination with deflection	CC	ILL2DFC
127	Illumination four guns	CC	ILL4C
128	Nonpersistent gas	CC	NONP
129	Persistent gas	CC	PERSP
130	Leaflets	CC	LEAF
131	Ammunition	CC	AMMO
132	Petroleum	CC	PETRO
133	Bridge equipment	CC	BRIDGE
134	Class one	CC	CLASS1
135	Class two	CC	CLASS2
136	Road	CC	ROADC
137	Junction	CC	JUNCT
138	Hill	CC	HILLC
139	Defile	CC	DEFILE
140	Landing strip	CC	LANDSTRIP
141	Rapid road	CC	RAPID
142	Light wheeled	CC	LIGHT
143	Heavy wheeled	CC	HEAVY
144	Reconnaissance	CC	RECON
145	Boats	CC	BOATS
146	Attack	CC	ATTACK
147	Helicopter	CC	HELICO
148	Light machine gun	CC	LIGHT
149	Antitank gun	CC	ANTI
150	Heavy machine gun	CC	HEAVY

151	Recoilless rifle	cdttttttttttRCLRC
152	Erase date time group	cdtttttttt___/___/___c
153	Erase sphere	cdtt_c

This concludes the section on the Tactical Fire Control Function. The next section will establish the vocabulary for the message associated with the Non-nuclear Fire Planning Function.

Non-nuclear Fire Planning Function - Commander's Criteria

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	Plan Name	cdt
11	Erase Plan name	cdt_____c
12	Date Time Group	cdtt_____c
13	Day	tt
14	Hour	tt
15	Minute	tt
16	Cursor reset	c
17	Zone of responsibility	cdtttt
18	Delete request	cdttttXc
19	Do not delete request	cdtttt_c
20	Ignore ammunition designator	cdttXc
21	Erase ammunition designator	cdtt_c
22	Effects cutoff factor	cdtt_c
23	Maximum battalions	cdtt

Non-nuclear Fire Planning Function - Fire Unit Exclusions

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	Plan Name	cdt
11	Erase Plan name	cdt_____c

12	Date	Time	Group	cccccccccccccccccccc
13	Day			cccccccccccccccccccc
14	Hour			cccccccccccccccccccc
15	Minute			cccccccccccccccccccc
16	Cursor	reset		cccccccccccccccccccc
17	Fire	units		cccccccccccccccccccc
18	Delete	request		cccccccccccccccccccc
19	Do not	delete request		cccccccccccccccccccc
20	First	shell type		cccccccccccccccccccc
21	Second	shell type		cccccccccccccccccccc
22	First	fuze type		cccccccccccccccccccc
23	Second	fuze type		cccccccccccccccccccc
24	1 0 5 5	millimeter		cccccccccccccccccccc
25	1 5 5 5	millimeter		cccccccccccccccccccc
26	1 7 5	millimeter		cccccccccccccccccccc
27	Eight	Inch		cccccccccccccccccccc
28	Honest	John		cccccccccccccccccccc
29	Lance			cccccccccccccccccccc
30	Hercules			cccccccccccccccccccc
31	M 9 1			cccccccccccccccccccc
32	3	inch	50	cccccccccccccccccccc
33	5	inch	38	cccccccccccccccccccc
34	5	inch	54	cccccccccccccccccccc
35	6	inch	47	cccccccccccccccccccc
36	8	inch	55	cccccccccccccccccccc
37	Foxtrot	ot 4	Delta	cccccccccccccccccccc
38	Foxtrot	ot 4	Echo	cccccccccccccccccccc
39	Foxtrot	ot 100		cccccccccccccccccccc
40	Foxtrot	ot 1 11		cccccccccccccccccccc
41	Foxtrot	ot 1 0 5		cccccccccccccccccccc
42	Alpha	7	Charlie	cccccccccccccccccccc
43	Alpha	7	Echo	cccccccccccccccccccc
44	Alpha	4	Echo	cccccccccccccccccccc
45	Alpha	4	Foxtrot	cccccccccccccccccccc
46	Alpha	4	Mike	cccccccccccccccccccc
47	Alpha	6	Alpha	cccccccccccccccccccc
48	Alpha	6	Echo	cccccccccccccccccccc
49	Alpha	10		cccccccccccccccccccc
50	Foxtrot	ot 4	Charlie	cccccccccccccccccccc
51	Alpha	7	Delta	cccccccccccccccccccc
52	Foxtrot	ot 4	Bravo	cccccccccccccccccccc
53	Foxtrot	ot 4	Juliet	cccccccccccccccccccc

Non-nuclear Fire Planning Function - Commander's Attack  
Method

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	Plan Name	cccccccccccccccccccc
11	Erase Plan name	cccccccccccccccccccc
12	Date Time Group	cccccccccccccccccccc
13	Day	cccccccccccccccccccc
14	Hour	cccccccccccccccccccc
15	Minute	cccccccccccccccccccc

16	Cursor reset	C
17	Desired effects	cdattt
18	Delete request	cdtttXc
19	Do not delete request	cdttt c
20	Standard volley factor	cdttt
21	Erase degree of protection	cdatt -----c
22	CURSOR reset	C
23	Erase target type	cdatt -----c
24	Air defense artillery	cdattADARTc
25	Armor	cdattARMORc
26	Artillery	cdattARTYc
27	Assembly areas	cdattASSYc
28	Building	cdattBLDGC
29	Bridge	cdattBRIDGEc
30	Center	cdattCENC
31	Equipment	cdattEQUIPC
32	Mortars	cdattMORTC
33	personnel	cdattPERSC
34	Rockets or Missiles	cdattRKTMSLc
35	Special missions	cdattSPECc
36	Supply dump	cdattSUPPLYc
37	Terrain features	cdattTERC
38	Vehicle	cdattVEHC
39	Weapons	cdattWPNC
40	Unknown	cdattUNKc
41	Light	cdattLTC
42	Medium	cdattMDMc
43	Heavy	cdattHVC
44	Missile	cdattMSLc
45	position	cdattPOSC
46	Armored personnel carrier	cdattAPCC
47	Troops	cdattTRPC
48	Troops and vehicles	cdattTRVEHC
49	Mechanized troops	cdattTRPARMc
50	Wood	cdattWOODc
51	Masonry	cdattMASNRYc
52	Concrete	cdattCONC
53	Metal	cdattMETC
54	Special purpose	cdattSPCLc
55	Foot pontoon	cdattFFPONc
56	Vehicle pontoon	cdattVEHPONc
57	Steel	cdattSTEELc
58	Site	cdattSITEc
59	Raft	cdattRAFTc
60	Ferry	cdattFERRYc
61	Small	cdattSMALLc
62	Battalion	cdattBNC
63	Regiment	cdattREGTC
64	Division	cdattDIVC
65	Forward	cdattFWDC
66	Radar	cdattRADARc
67	Electronic warfare	cdattEWC
68	Searchlight	cdattSLTC
69	Guidance	cdattGDNCC
70	Loudspeaker	cdattLSC
71	Very heavy	cdattVHC
72	Infantry	cdattINFc
73	Observation post	cdattOPC
74	Patrol	cdattPTLc
75	Work party	cdattWKPTc
76	Antipersonnel	cdattAPERSC
77	Light missile	cdattLTMSLc
78	Medium missile	cdattMDMSLc
79	Heavy missile	cdattHVMSLc
80	Antitank	cdattATANKc
81	Illumination one gun	cdattILL1c
82	Illumination two guns	cdattILL2c

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83 Illumination with deflection C d d d d d d d d d d L2DFC
84 Illumination with deflection C d d d d d d d d d d L2RGC
85 Illumination with deflection C d d d d d d d d d d L4C
86 Nonpersistent gas C d d d d d d d d d d GASNONC
87 Persistent gas C d d d d d d d d d d GASPERC
88 Leaflets C d d d d d d d d d d LEAFC
89 Ammunition C d d d d d d d d d d AMMO C
90 Petroleum C d d d d d d d d d d PETL C
91 Bridge equipment C d d d d d d d d d d BRGEQC
92 Class one C d d d d d d d d d d CLIC
93 Class two C d d d d d d d d d d CLIC
94 Road C d d d d d d d d d d ROAD C
95 Junction C d d d d d d d d d d JCTC
96 Hill C d d d d d d d d d d HILL C
97 Defile C d d d d d d d d d d DEFILEC
98 Landing strip C d d d d d d d d d d LDGSTRC
99 Railroad C d d d d d d d d d d RRRC
100 Light wheeled C d d d d d d d d d d LTWHLC
101 Heavy wheeled C d d d d d d d d d d HVWHLC
102 Reconnaissance C d d d d d d d d d d RECONC
103 Boats C d d d d d d d d d d BTC
104 Aircraft C d d d d d d d d d d ACFT C
105 Helicopter C d d d d d d d d d d HELIC
106 Light machine gun C d d d d d d d d d d LTMGC
107 Antitank gun C d d d d d d d d d d ATGC
108 Heavy machine gun C d d d d d d d d d d HVMGC
109 Recoilless rifle C d d d d d d d d d d RCLRC
110 Erase target subtype C d d d d d d d d d d ----- C

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Non-nuclear Fire Planning Function - Fire Unit Selection

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	Plan Name	C d d d
11	Erase Plan name	C d d d
12	Date Time Group	C d d d d d d d d d d ----- C
13	Day	H
14	Hour	H
15	Minute	M
16	Cursor reset	C
17	Fire units	C d d d d d
18	Delete request	C d d d d d d d d d d Xc
19	Do not delete request	C d d d d d d d d d d -C
20	Battalion name	C d d d d d d d d d d -C
21	Battalion order number	C d d d d d d d d d d
22	Maximum volleys	C d d d d d d d d d d
23	Ordering of fire units	C d d d d d d d d d d
24	1 0 5 millimeter	C d d d d d d d d d d 105MM C
25	1 5 5 millimeter	C d d d d d d d d d d 155MM C
26	1 7 5 millimeter	C d d d d d d d d d d 175MM C
27	Eight Inch	C d d d d d d d d d d 8INC
28	Honest John	C d d d d d d d d d d HJC
29	Lance	C d d d d d d d d d d LANC
30	Hercules	C d d d d d d d d d d HERC C

31	M 9 1		O d d d d d d d M 9 1 c
32	W i n c h 5 0		O d d d d d d d I N 5 0 c
33	W i n c h 5 0 8		O d d d d d d d I N 3 8 c c
34	W i n c h 5 4		O d d d d d d d I N 5 4 c c c
35	W i n c h 4 7		O d d d d d d d I M 4 7 c c
36	8 i n c h 5 5		O d d d d d d d 8 I N 5 5 c
37	F o x t r o t 4 D e l t a		O d d d d d d d F 4 D C
38	F o x t r o t 4 E c h o		O d d d d d d d F 4 E C
39	F o x t r o t 1 0 0		O d d d d d d d F 1 0 0 c c
40	F o x t r o t 1 1 1		O d d d d d d d F 1 1 1 c c c
41	F o x t r o t 1 0 5		O d d d d d d d F 1 0 5 c c
42	A l p h a 7 C h a r l i e		O d d d d d d d A 7 C C
43	A l p h a 7 E c h o		O d d d d d d d A 7 E C
44	A l p h a 4 E c h o		O d d d d d d d A 4 E C
45	A l p h a 4 F o x t r o t		O d d d d d d d A 4 F C
46	A l p h a 4 M i k e		O d d d d d d d A 4 M C
47	A l p h a 6 A l p h a		O d d d d d d d A 6 A C
48	A l p h a 6 E c h o		O d d d d d d d A 6 E C
49	A l p h a 1 0		O d d d d d d d A 1 0 c c
50	F o x t r o t 4 C h a r l i e		O d d d d d d d F 4 C C
51	A l p h a 7 D e l t a		O d d d d d d d A 7 D C
52	F o x t r o t 4 B r a v o		O d d d d d d d F 4 B C
53	F o x t r o t 4 J u l i e t		O d d d d d d d F 4 J C
54	W i n c h		O d d d d d d d
55	E n d		E
56	E n d		-

The remaining words should be made up of battalion names, plan names, and fire unit names. The fire unit names should not end with a cursor reset because a series of fire units can be entered in this message format. The fire unit names should end with a right cursor.

Non-nuclear Fire Planning Function - Planning Target Instructions

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	Target number	0 d d t
11	Phrase target number	A-----r
12	Alpha	A
13	Bravo	B
14	Charlie	C
15	Delta	D
16	Echo	E

17	Fox	o t	F
18	Golf		G
19	Hotel		H
20	India		I
21	Juliett		J
22	Kilo		K
23	Lima		L
24	Mike		M
25	November		N
26	Oscar		O
27	Papa		P
28	Quebec		Q
29	Romeo		R
30	Sierra		S
31	Tango		T
32	Uniform		U
33	Victor	m	V
34	Whiskey		W
35	X-ray		X
36	Yankee		Y
37	Zulu		Z
38	Left		L
39	Right		R
40	Erase		E
41	Plan name		P
42	Erase plan name		E
43	Fire plan target list		F
44	Erase fire plan target list		E
45	Cursor reset		C
46	On-call		O
47	Erase on-call		E
48	Delete request		D
49	Do not delete request		D
50	Priority of targets		P
51	Erase of targets		E
52	Time from H hour		T
53	Group		G
54	Series name		S
55	Series number		S
56	Erase units		E
57	Desire of the unit		D
58	Number of volleys		N
59	Initial shell		I
60	Subsequent shell		S
61	Initial fuze		I
62	Subsequent fuze		S
63	Low angle of fuze		L
64	High angle of fuze		H
65	Erase angle of fuze		E
66	Erase fuze		E
67	Erase shell		E
68			

Non-nuclear Fire Planning Function = Planning Target

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5

6	Six	6	6
7	Seven	7	7
8	Eight	8	8
9	Nine	9	9
10	Target number	0	0
11	Erase target number	1	1
12	Alpha	A	A
13	Bravo	B	B
14	Charlie	C	C
15	Delta	D	D
16	Echo	E	E
17	Foxtrot	F	F
18	Golf	G	G
19	Hotel	H	H
20	India	I	I
21	Juliett	J	J
22	Kilo	K	K
23	Lima	L	L
24	Mike	M	M
25	November	N	N
26	Oscar	O	O
27	Papa	P	P
28	Quebec	Q	Q
29	Romeo	R	R
30	Sienna	S	S
31	Tango	T	T
32	Uniform	U	U
33	Victor	V	V
34	Whiskey	W	W
35	X ray	X	X
36	Yankee	Y	Y
37	Zulu	Z	Z
38	Left	L	L
39	Right	R	R
40	Erase	E	E
41	Plan name	C	C
42	Erase subtype	C	C
43	Record target	C	C
44	Coordinate east	C	C
45	Coordinate north	C	C
46	Altitude	C	C
47	Grid zone	C	C
48	Spheroid	C	C
49	Target radius	C	C
50	Target length	C	C
51	Target width	C	C
52	Erase record	C	C
53	Erase plan name	C	C
54	Erase strength	C	C
55	Erase report value	C	C
56	Altitude	C	C
57	Strength of target	C	C
58	Report value	C	C
59	Suspected target	C	C
60	Erase suspected target	C	C
61	Delete request	C	C
62	Do not delete request	C	C
63	Erase degree of protection	C	C
64	Cursor reset	C	C
65	Erase target type	C	C
66	Air defense artillery	C	C
67	Armor	C	C
68	Artillery	C	C
69	Assembly areas	C	C
70	Building	C	C
71	Bridge	C	C
72	Center	C	C









105	Regiment	REGTC
106	Division	DIVC
107	Forward	FWDC
108	Radar	RADARc
109	Electronic warfare	EWc
110	Searchlight	SLc
111	Guidance	GDNCc
112	Loudspeaker	LSc
113	Very heavy	VHC
114	Infantry	INFC
115	Observation post	OPC
116	Patrol	PTLc
117	Work party	WKPTYc
118	Anti personnel	APERSc
119	Light missile	LTMSc
120	Medium missile	MDMSLc
121	Heavy missile	HVMSLc
122	Antitank	ATANKc
123	Illumination one gun	ILL1c
124	Illumination two guns	ILL2c
125	Illumination with deflection	ILL2DF
126	Illumination with range	ILL2RG
127	Illumination four guns	ILL4c
128	Nonpersistent gas	GASNON
129	persistent gas	GASPER
130	Leaflets	LEAFc
131	Ammunition	AMMOc
132	petroleum	PTLc
133	Bridge equipment	BRGEQc
134	Class one	CL1c
135	Class two	CL2c
136	Road	ROADc
137	Junction	JCTc
138	Hill	HILLc
139	Defile	DEFILc
140	Landing strip	LDGSTc
141	Railroad	RRc
142	Light wheeled	LFWHLc
143	Heavy wheeled	HVWHLc
144	Reconnaissance	RECONc
145	Boats	BTC
146	Aircraft	ACFTc
147	Helicopter	HELc
148	Light machine gun	LTMGC
149	Antitank gun	ATGC
150	Heavy machine gun	HVMGC
151	Recoilless rifle	RCLRC
152	Erase grid zone	ERASEc
153	Erase sphere	ERASEc
154	Half prone half standing	GRANDc
155	prone	PRONc
156	prone dug in	PRUGc
157	prone overhead cover	PROVERc
158	dug in	DUGINc
159	Under overhead cover	COVERc

Non-nuclear Fire Planning Function - Reserve Fire Unit

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3

4	four					4
5	five					5
6	six					6
7	seven					7
8	eight					8
9	nine					9
10	plan name					cdt
11	phase plan name					cdt
12	hour					cdt-----c
13	minute					dt
14	oncall					cdttttXc
15	phase oncall					cdttttc
16	priority					cdttttc
17	phase priority					cdttttc
18	preliminary target list					cdttttttXc
19	preliminary target list					cdttttttc
20	phase one					cdtttt
21	phase two					cdtttt
22	phase three					cdtttt
23	phase four					cdtttt
24	right					-1
25	left					-1
26	phase					-1

Non-nuclear Fire Planning Function - Compute a Fire Plan

Word number	Phrase Spoken	Output string
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	plan name	cdt
11	phase plan name	cdt
12	hour	cdt-----c
13	minute	dt
14	oncall	cdttttXc
15	phase oncall	cdttttc
16	priority	cdttttc
17	phase priority	cdttttc
18	preliminary target list	cdttttttXc
19	preliminary target list	cdttttttc
20	phase one	cdtttt
21	phase two	cdtttt
22	phase three	cdtttt
23	phase four	cdtttt
24	Right	-1
25	Left	-1
26	Phase	-1

Non-nuclear Fire Planning Function - Fire Plan Alteration

Word number	Phrase Spoken	Output string
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9

10	Target number	0
11	Erase target number	cdttt
12	Alpha	ttt
13	Bravo	-----c
14	Charlie	A
15	Delta	B
16	Echo	C
17	Foxtrot	D
18	Golf	E
19	Hotel	F
20	India	G
21	Juliet	H
22	Kilo	I
23	Lima	J
24	Mike	K
25	November	L
26	Oscar	M
27	Papa	N
28	Quebec	O
29	Romeo	P
30	Sierra	Q
31	Tango	R
32	Uniform	S
33	Victor	T
34	Whiskey	U
35	Xray	V
36	Yankee	W
37	Zulu	X
38	Left	Y
39	Right	Z
40	Erase	ll
41	Plan name	cdt
42	Erase plan name	cdtt
43	File plan target list	cdtttXc
44	Add data	cdtttXc
45	Cursor reset	c
46	Erase add data	cdttttc
47	H Hour	cdtttttc
48	Delete request	cdtttttcXc
49	Do not delete request	cdtttttttc
50	File unit	cdtttttttc
51	Erase file unit	cdtttttttc
52	Desired effects	cdtttttttc//_/_/_/_/_/_
53	Number of volleys	cdtttt
54	Initial shell	cdttttt
55	Subsequent shell	cdtttttttttt
56	Initial fuze	cdtttttttt
57	Subsequent fuze	cdtttttttttttt
58	Detonate on impact	cdttttttttttttYESc
59	Other than impact	cdttttttttttttNOC
60	High angle	cdttttttttttttHIGHc
61	Low angle	cdttttttttttttLOWc

Non-nuclear Fire Planning Function - User Commands

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6

7 save  
 8 saveq  
 9 saveq  
 10 target number  
 11 target number  
 12 Alpha  
 13 Onavo  
 14 Charlie  
 15 Delta  
 16 Echo  
 17 Foxtrot  
 18 Golf  
 19 Hotel  
 20 Ipsilon  
 21 Juliet  
 22 Kilo  
 23 Lima  
 24 Mike  
 25 November  
 26 Oscar  
 27 Papa  
 28 Quebec  
 29 Romeo  
 30 Sierra  
 31 Tango  
 32 Uniform  
 33 Victor  
 34 Whiskey  
 35 Xray  
 36 Yankee  
 37 Zulu  
 38 Left  
 39 Right  
 40 Base  
 41 plan name  
 42 base plan name  
 43 New plan  
 44 Default MOD  
 45 base default MOD  
 46 Abort request  
 47 base abort request  
 48 Purge  
 49 base purge  
 50 Delete request  
 51 Do not delete request  
 52 Edit request  
 53 base edit request  
 54 Print request  
 55 base print request  
 56 New request  
 57 base view request  
 58 Show request  
 59 base show request  
 60 Show request  
 61 base show request  
 62 Update destination  
 63 base destination  
 64 Override  
 65 base override  
 66 Change count  
 67 base change count  
 68 Delete list  
 69 base delete list  
 70 Change plan list  
 71 base change list  
 72 Change in schedule  
 73 base targets in schedule

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74	On call	cd d d d d t t t t t Xc
75	Erase on call	cd d d d d t t t t t c
76	Phase of targets	cd d d d d t t t t t c
77	Erase phase of targets	cd d d d d t t t t t c
78	Zone of responsibility	cd d d d d t t t t t c
79	Erase zone of responsibility	cd d d d d t t t t t c
80	Overlap distance	cd d d d d t t t t t c
81	Erase overlap distance	cd d d d d t t t t t c
82	All files	cd d d d d t t t t t Xc
83	Erase all files	cd d d d d t t t t t c
84	Schedule of fires	cd d d d d t t t t t Xc
85	Erase schedule of fires	cd d d d d t t t t t c
86	Group of fires	cd d d d d t t t t t Xc
87	Erase group of fires	cd d d d d t t t t t c
88	Series of fires	cd d d d d t t t t t Xc
89	Erase series of fires	cd d d d d t t t t t c
90	Ammunition report	cd d d d d t t t t t Xc
91	Erase ammunition report	cd d d d d t t t t t c
92	Fire plan summary	cd d d d d t t t t t Xc
93	Erase fire plan summary	cd d d d d t t t t t c
94	Reserve fire units	cd d d d d t t t t t Xc
95	Erase fire units	cd d d d d t t t t t c
96	Modification data	cd d d d d t t t t t Xc
97	Erase modification data	cd d d d d t t t t t c
98	Build a MOD file	cd d d d d t t t t t Xc
99	Erase build a MOD file	cd d d d d t t t t t c
100	Update nuclear targets	cd d d d d t t t t t Uc
101	All nuclear targets	cd d d d d t t t t t AC
102	Specified nuclear targets	cd d d d d t t t t t Sc
103	Erase nuclear targets	cd d d d d t t t t t c
104	Plain test	cd d d d d t t t t t t

This concludes the vocabulary lists for the Non-nuclear Fire planning Function. The next section will cover the vocabulary necessary to use voice data entry in correspondence to the Artillery Intelligence Function

Artillery Intelligence Function - Fire Mission Criteria

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	Date time group	cdt
11	Erase date time group	cdt___/___/___c
12	Day	H
13	Hour	H



14	Minute	n
15	Delete request	cdttXc
16	Do not delete request	cdtt_c
17	Coordinate report	cdttXc
18	Erase coordinate report	cdtt_c
19	Solution report	cdttXc
20	Erase solution report	cdtt_c
21	Report value	cdtt
22	Weight type target	cdtt
23	Weight degree of protection	cdtt
24	Weight target size	cdtt

Artillery Intelligence Function - Target Buildup Criteria

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	Date time group	cdt
11	Erase date time group	cdt___/___/___c
12	Day	n
13	Hour	n
14	Minute	n
15	Delete request	cdttXc
16	Do not delete request	cdtt_c
17	About request	cdttXc
18	Erase about request	cdtt_c
19	Test criteria number	cdtt
20	Erase test criteria number	cdtt_c
21	Search	cdttXc
22	Erase search	cdtt_c

Artillery Intelligence Function - Standard Value Criteria

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	Date time group	cdt
11	Erase date time group	cdt___/___/___c
12	Day	n
13	Hour	n
14	Minute	n
15	Delete request	cdttXc
16	Do not delete request	cdtt_c

17	Max time difference X	cdt
18	January	cdt
19	February	cdt
20	February leap year	cdt
21	March	cdt
22	April	cdt
23	May	cdt
24	June	cdt
25	July	cdt
26	August	cdt
27	September	cdt
28	October	cdt
29	November	cdt
30	December	cdt
31	Max time difference Y	cdt
32	Erase month	cdt
33	Report value	cdt
34	Erase report value	cdt
35	Report value criteria	cdt
36	Erase report value criteria	cdt
37	Max protection difference	cdt
38	Left	h
39	Right	h
40	Erase	h
41	Combination difference	cdt
42	Relative proximity factor	cdt

The months of the year have been included in this vocabulary list so the operator will not have to determine the number of days in the previous month. The operator just has to say the name of the month and the proper days are output in the message template.

Artillery Intelligence Function - Data Print Criteria

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	Date time group	cdt
11	Erase date time group	cdt
12	Day	h
13	Hour	h
14	Minute	h
15	Delete request	cdtXc
16	Do not delete request	cdt
17	Recommend combination	cdtXc
18	Erase recommend combination	cdt
19	Recommend inspection	cdtXc

20	Erase recommend inspection	cdtttttc
21	In fan	cdttttttXc
22	Erase in fan	cdtttttttc
23	Compatible	cdttttttttXc
24	Erase compatible	cdtttttttttc
25	Incompatible	cdttttttttttXc
26	Erase incompatible	cdtttttttttt_c

Artillery Target Intelligence - Data Base Modification

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	F O	cdttFOc
11	F O without laser	cdttFOWLc
12	Observer not artillery	cdttOBSRC
13	Long range recon patrol	cdttLRRPC
14	Target base	cdttTGTC
15	Air observer	cdttAOBSRC
16	Sound ranging	cdttSORNGC
17	Flash ranging	cdttFLRNGC
18	Counter mortar radar	cdttCMRRC
19	Counter battery radar	cdttCBRRC
20	Photo interpretation	cdttPIC
21	Prisoner of war	cdttPOWC
22	Ground surveillance radar	cdttGSRAC
23	Side looking airborne radar	cdttSLARC
24	Airborne infrared	cdttIRC
25	Tactical air	cdttTACAIRc
26	Communication intelligence	cdttCOMINTc
27	Electronic intelligence	cdttELINTc
28	Erase agency	cdtt-----c
29	Meter accuracy	cdttt
30	Mil accuracy	cdttt
31	Range to target	cdttt
32	Range error	cdttttttttt
33	Location error	cdttttt
34	Left	L
35	Right	R
36	Air defense artillery	cdttADAC
37	Armor	cdttARMORc
38	Artillery	cdttARTYC
39	Assembly areas	cdttASSYC
40	Building	cdttBLDGC
41	Bridge	cdttBRIDGEc
42	Center	cdttCENC
43	Equipment	cdttEQUIPC
44	Mountains	cdttMORTC
45	Personnel	cdttPERSONc
46	Rockets or Missiles	cdttRKTMSLc
47	Special missions	cdttSPECc
48	Supply dump	cdttSUPPLYc
49	Terrain features	cdttTERFc
50	Vehicle	cdttVEHC
51	Weapons	cdttWPNC

52  
53

Phrase  
Phrase target type

date\_\_\_\_\_c

Artillery Target Intelligence - Coordinate Report

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	F O	cdtttttFOc
11	F O without laser	cdtttttFOWLc
12	Observer not artillery	cdtttttOBSRC
13	Long range recce patrol	cdtttttLRRPC
14	Target base	cdtttttTGTEC
15	Air observer	cdtttttAOBSRC
16	Sound ranging	cdtttttSORNGC
17	Flash ranging	cdtttttFLRNGC
18	Counter mortar radar	cdtttttCMRRC
19	Counter battery radar	cdtttttCBRRC
20	photo interpretation	cdtttttPIC
21	prisoner of war	cdtttttPOWC
22	Ground surveillance radar	cdtttttGSRAC
23	Side looking airborne radar	cdtttttSLARC
24	Airborne infrared	cdtttttIRC
25	Tactical air	cdtttttTACAIRC
26	Communication intelligence	cdtttttCOMINTC
27	Electronic intelligence	cdtttttELINTC
28	Erase agency	cdttttt-----c
29	Target update	cdtXc
30	Erase target update	cdt c
31	Delete request	cdtXc
32	Do not delete request	cdt c
33	Target number	cdttt
34	Left	l
35	Right	r
36	Erase	e
37	Cursor reset	r
38	Delete target number	cdttt
39	Do not adjust coordinates	cdtttttXc--c
40	Erase adjust coordinates	cdttttt c
41	Do not combine description	cdtttttXc
42	Alpha	A
43	Bravo	B
44	Charlie	C
45	Delta	D
46	Echo	E
47	Foxtrot	F
48	Golf	G
49	Hotel	H
50	India	I
51	Juliet	J
52	Kilo	K
53	Lima	L
54	Mike	M
55	November	N
56	Oscar	O

57	Papa	P
58	Quebec	Q
59	Romeo	R
60	Sierra	S
61	Tango	T
62	Uniform	U
63	Victor	V
64	Whiskey	W
65	X-ray	X
66	Yankee	Y
67	Zulu	Z
68	Phrase Combine description	CC
69	Phrase request	CC
70	Phrase filter request	CC
71	Coordinate east	CC
72	Coordinate north	CC
73	Altitude	CC
74	Grid zone	CC
75	Spheroid	CC
76	Target radius	CC
77	Target length	CC
78	Target width	CC
79	Attitude	CC
80	Phrase subtype	CC
81	Target latitude	CC
82	Target longitude	CC
83	Phrase target type	CC
84	Air defense artillery	CC
85	Armor	CC
86	Artillery	CC
87	Assembly areas	CC
88	Building	CC
89	Bridge	CC
90	Center	CC
91	Equipment	CC
92	Mortars	CC
93	Personnel	CC
94	Rockets or Missiles	CC
95	Special missions	CC
96	Supply dump	CC
97	Terrain features	CC
98	Vehicle	CC
99	Weapons	CC
100	Unknown	CC
101	Light	CC
102	Medium	CC
103	Heavy	CC
104	Missile	CC
105	Position	CC
106	Armored personnel carrier	CC
107	Troops	CC
108	Troops and vehicles	CC
109	Mechanized troops	CC
110	Wood	CC
111	Masonry	CC
112	Concrete	CC
113	Metal	CC
114	Special purpose	CC
115	Foot pontoon	CC
116	Vehicle pontoon	CC
117	Steel	CC
118	Sidewalk	CC
119	Raft	CC
120	Ferry	CC
121	Small	CC
122	Battalion	CC
123	Regiment	CC



181	Hours	0
182	Tropical uniform	A
183	Summer uniform with mask	C
184	Body covered	C
185	Body heavily covered	C
186	Erase clothing	C
187	15 sec cond training	15
188	30 sec cond training	30
189	No C R training	0
190	Erase training	C
191	Bare	C
192	Shrubs	SHRUBS
193	Woods	WOODS
194	Erase vegetation	C
195	0 to 1 hour	001
196	1 to 3 hours	0103
197	3 to 12 hours	0312
198	12 to 24 hours	1224
199	more than 24 hours	2400
200	Erase target permanence	C
201	Neutralized	NEUTC
202	Burning	BURNC
203	Neutralized and burning	NEUT/BURNC
204	Destroyed	DESTC
205	Can not observe	CNOC
206	Unknown	UNKNC
207	None	NONEC
208	Erase disposition	C
209	Cassula destroyed	-----C
210	Missile on target	X
211	Erase mission fired	C
212	Plain text	C
213	Plain text message	C

Artillery Target Intelligence - Azimuth Distance Report

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	10	00
11	10 without laser	00FLC
12	Observer not artillery	00BSNFC
13	Long range recce patrol	00LRRFCC
14	Target base	00GTBFC
15	Air observer	00AOBSFC
16	Sound hanging	00SORNGCC
17	Flash hanging	00LFRNGCC
18	Counter mortar radar	00CMRRFC
19	Counter battery radar	00CBRRFC
20	Photo interpretation	00PHVPC
21	Observer waypoint	00POWFC
22	Ground surveillance radar	00GSRAC
23	Side lobe tracking radar	00SLARC
24	Airborne tracking radar	00AIRAC
25	Factual information radar	00FACAIRC

26	Communication intelligence	cdttttt	COMINTC
27	Electronic intelligence	cdttttt	ELINTC
28	Erase agency	cdttttt	-----C
29	Target update	cdttXc	
30	Erase target update	cdttc	
31	Delete request	cdttXc	
32	Do not delete request	cdttc	
33	Target number	cdttt	
34	Left	I	
35	Right	H	
36	Erase		
37	Cursor reset	C	
38	Delete target number	cdtttt	-----C
39	Do not adjust coordinates	cdtttttXc	
40	Erase adjust coordinates	cdttttt	c
41	Do not combine description	cdtttttXc	
42	Alpha	A	
43	Bravo	B	
44	Charlie	C	
45	Delta	D	
46	Echo	E	
47	Foxtrot	F	
48	Golf	G	
49	Hotel	H	
50	India	I	
51	Juliett	J	
52	Kilo	K	
53	Lima	L	
54	Mike	M	
55	November	N	
56	Oscar	O	
57	Papa	P	
58	Quebec	Q	
59	Romeo	R	
60	Sierra	S	
61	Tango	T	
62	Uniform	U	
63	Victor	V	
64	Whiskey	W	
65	X ray	X	
66	Yankee	Y	
67	Zulu	Z	
68	Erase combine description	cdttttttt	c
69	Surveyed location	cdtttttttXc	
70	Erase surveyed location	cdttttttt	c
71	Coordinate east	cdtt	
72	Coordinate north	cdtttttttttttttttt	
73	Altitude	cdtttttttttttttttt	
74	Grid zone	cdtttt	
75	Spheroid	cdtttttt	
76	Target radius	cdtttttt	
77	Target length	cdtttttt	
78	Target width	cdtttttt	
79	Attitude	cdtttttttttttttttt	
70	Erase subtype	cdtttttttttttttttt	-----C
71	Azimuth	cdtttttttttttttttt	
72	Distance	cdtttttttt	
73	Erase target type	cdtttttttttttttttt	c
74	Air defense artillery	cdtttttttttttttttt	ADAC--C
75	Armor	cdtttttttttttttttt	ARMORC
76	Artillery	cdtttttttttttttttt	ARTYC
77	Assembly areas	cdtttttttttttttttt	ASSYC
78	Building	cdtttttttttttttttt	BLDGC
79	Bridge	cdtttttttttttttttt	BRIDGEC
80	Center	cdtttttttttttttttt	CENCC
81	Equipment	cdtttttttttttttttt	EQUIPC
82	Mortars	cdtttttttttttttttt	MORTCC





150	Light wheeled	0000000000000000000000	LTWHLC
151	Heavy wheeled	0000000000000000000000	HVWHLC
152	Reconnaissance	0000000000000000000000	RECONC
153	Boats	0000000000000000000000	BFC
154	Aircraft	0000000000000000000000	ACFTC
155	Helicopter	0000000000000000000000	HELIC
156	Light machine gun	0000000000000000000000	LTMGC
157	Anti tank gun	0000000000000000000000	ATGC
158	Heavy machine gun	0000000000000000000000	HVMGC
159	Recoilless rifle	0000000000000000000000	RCLR
160	Half prone half standing	0000000000000000000000	PRANDC
161	Prone	0000000000000000000000	PRONEC
162	Prone dug in	0000000000000000000000	PRUGC
163	Prone overhead cover	0000000000000000000000	PROVERC
164	Dug in	0000000000000000000000	DUGINC
165	Under overhead cover	0000000000000000000000	COVERC
166	Degrees	0000000000000000000000	
167	Minutes	0000000000000000000000	
168	Seconds	0000000000000000000000	
169	Erase degree of protection	0000000000000000000000	C
170	Report value	0000000000000000000000	
171	Excellent reliability	0000000000000000000000	C
172	Good reliability	0000000000000000000000	C
173	Fair reliability	0000000000000000000000	C
174	Poor reliability	0000000000000000000000	C
175	Strength of target	0000000000000000000000	
176	Target altitude	0000000000000000000000	
177	Confirm target	0000000000000000000000	XC
178	Erase confirm target	0000000000000000000000	C
179	Date time group	0000000000000000000000	
180	Days	0000000000000000000000	
181	Hours	0000000000000000000000	
182	Tropical uniform	0000000000000000000000	AC
183	Summer uniform with mask	0000000000000000000000	BC
184	Body covered	0000000000000000000000	CC
185	Body heavily covered	0000000000000000000000	DC
186	Erase clothing	0000000000000000000000	C
187	15 second training	0000000000000000000000	15SC
188	30 second training	0000000000000000000000	30SC
189	No CBR training	0000000000000000000000	TCDC
190	Erase training	0000000000000000000000	C
191	Bare	0000000000000000000000	BARC
192	Shrubs	0000000000000000000000	SHRUBC
193	Woods	0000000000000000000000	WOODSC
194	Erase vegetation	0000000000000000000000	C
195	0 to 1 hour	0000000000000000000000	000TC
196	1 to 3 hours	0000000000000000000000	0103C
197	3 to 12 hours	0000000000000000000000	0312C
198	12 to 24 hours	0000000000000000000000	1224C
199	More than 24 hours	0000000000000000000000	2400C
200	Erase target permanence	0000000000000000000000	C
201	Neutralized	0000000000000000000000	NEUTC
202	Burning	0000000000000000000000	BURNC
203	Neutralized and burning	0000000000000000000000	NEUT/BU
204	Destroyed	0000000000000000000000	DESTC
205	Can not observe	0000000000000000000000	CNOC
206	Unknown	0000000000000000000000	UNKC
207	None	0000000000000000000000	NCNEC
208	Erase disposition	0000000000000000000000	
209	Casualties	0000000000000000000000	
210	Mission failed	0000000000000000000000	XC
211	Erase mission failed	0000000000000000000000	C
212	Plain text	0000000000000000000000	
213	Plain text message	0000000000000000000000	
214	Vertical shift	0000000000000000000000	

Artillery Target Intelligence - Shell Report

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	10	00
11	10 without laser	00
12	Observer not artillery	00
13	Long range recon patrol	00
14	Target base	00
15	Air observer	00
16	Sound ranging	00
17	Flash ranging	00
18	Counter mortar radar	00
19	Counter battery radar	00
20	Photo interpretation	00
21	Prisoner of war	00
22	Ground surveillance radar	00
23	Side looking airborne radar	00
24	Airborne infrared	00
25	Tactical air	00
26	Communication intelligence	00
27	Electronic intelligence	00
28	Phrase agency	00
29	Target update	00
30	Phrase target update	00
31	Delete request	00
32	Do not delete request	00
33	Target number	00
34	Left	1
35	Right	1
36	Phrase	1
37	Cursor reset	10
38	Delete target number	00
39	Do not adjust coordinates	00
40	Phrase adjust coordinates	00
41	Do not combine description	00
42	Alpha	A
43	BraVO	B
44	Charlie	C
45	Delta	D
46	Echo	E
47	Foxrot	F
48	Goiter	G
49	Hotel	H
50	India	I
51	Juliett	J
52	Kilo	K
53	Lima	L
54	Mike	M
55	November	N
56	Oscar	O
57	Papa	P
58	Quebec	Q
59	Romeo	R
60	Sierra	S
61	Tango	T

62	Uniform	U
63	Victor	V
64	Whiskey	W
65	X ray	X
66	Yankee	Y
67	Zulu	Z
68	Erase weapon type	cdddtt
69	Erase weapon subtype	cdddtt-----c
70	Azimuth	cdddtt
71	Coordinate east	cdtt
72	Coordinate north	cdtt-----
73	Altitude	cdttllllllllll
74	Grid zone	cdtt
75	Spheroid	cdtttt
76	Caliber	cdtttt
77	Rounds impacted	cdtttttt
78	Report value	cdtttt
79	Excellent reliability	cdttttttEC
80	Good reliability	cdttttttGC
81	Fair reliability	cdttttttFC
82	Mortar	cdttMORT-----
83	Artillery	cdttARTY-----
84	Unknown	UNKc
85	Light	LTC
86	Medium	MDMC
87	Heavy	HVC
88	Very heavy	VHC
89	Excellent reliability	cdttttttEC
90	Good reliability	cdttttttGC
91	Date time group	cdtttttt
92	Days	-----
93	Hours	-----
94	Minutes	-----
95	plain text	cdtttttt
96	plain text message	cdtttttttt

Artillery Target Intelligence - Surveillance Report

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	Target number	cdtt
11	Erase target number	cdtt-----c
12	Date time group	cdtttttt
13	Right	-----
14	Left	-----
15	Cursor reset	-----
16	Day	-----
17	Minute	-----
18	Hour	-----
19	Plain text message	cdtt
20	Alpha	A
21	Bravo	B
22	Charlie	C
23	Delta	D

24  
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45

Foot  
Golf  
Hotel  
India  
Juliet  
Kilo  
 Lima  
Mike  
November  
Oscar  
 Papa  
Quebec  
 Romeo  
 Sierra  
 Tango  
 Uniform  
 Victor  
 Whiskey  
 X-ray  
 Yankee  
 Zulu

P  
Q  
R  
S  
T  
U  
V  
W  
X  
Y  
Z

Artillery Target Intelligence - Combat Information Report

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	Ten	10
11	Eleven	11
12	Date time group	cdtt
13	Cursor reset	0
14	Plain text message	cdtt
15	Hour	11
16	Day	11
17	Minute	11

Artillery Target Intelligence - Mission Firing Report

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	FO	cdttFOc

11	F O without laser	G d d d d F O W L C
12	Observer not artillery	G d d d d O B S R C
13	Long range recce patrol	G d d d d L R R P C
14	Target base	G d d d d T G T B C
15	Air observer	G d d d d A O B S R C
16	Sound ranging	G d d d d S O R N G C
17	Flash ranging	G d d d d F L R N G C
18	Counter mortar radar	G d d d d C M R R C
19	Counter battery radar	G d d d d C B R R C
20	Photo interpretation	G d d d d P I C
21	Prisoner of war	G d d d d P O W C
22	Ground surveillance radar	G d d d d G S R A C
23	Side looking airborne radar	G d d d d S L A R C
24	Airborne infrared	G d d d d I R C
25	Tactical air	G d d d d T A C A I R C
26	Communication intelligence	G d d d d C O M I N T C
27	Electronic intelligence	G d d d d E L I N T C
28	Erase agency	G d d d d ----- C
29	Plain text message	G d d d d d d d d
30	Plain text	G d d d d d d d d d
31	Date time group	G d d d d d d d d
32	Day	H
33	Target number	G d d
34	Left	=
35	Right	=
36	Erase	G
37	Cursor reset	G
38	Erase target number	G d d ----- C
39	Hour	H
40	Minute	M
41	Casualties	G d d d d d d d
42	Alpha	A
43	Bravo	B
44	Charlie	C
45	Delta	D
46	Echo	E
47	Foxtrot	F
48	Golf	G
49	Hotel	H
50	India	I
51	Juliet	J
52	Kilo	K
53	Lima	L
54	Mike	M
55	November	N
56	Oscar	O
57	Papa	P
58	Quebec	Q
59	Romeo	R
60	Sierra	S
61	Tango	T
62	Uniform	U
63	Victor	V
64	Whiskey	W
65	X ray	X
66	Yankee	Y
67	Zulu	Z
68	Disposition none	G d d d d d d d N O N E C
69	Erase target disposition	G d d d d d d d
70	Disposition unknown	G d d d d d d d U N K N ----- C
71	Coordinate east	G d d d d d
72	Coordinate north	G d d d d d
73	Altitude	G d d d d d d d d d d d d d d
74	Grid zone	G d d d d
75	Spheroid	G d d d
76	Can not observe	G d d d d d d d C N O C
77	Destroyed	G d d d d d d d D E S T C



135	Illumination four guns	ILL4C
136	Nonpersistent gas	GASNOX
137	Persistent gas	GASPER
138	Leaflets	LEAF C
139	Ammunition	AMMO C
140	Petroleum	PETL C
141	Bridge equipment	BRIDGE C
142	Class one	CLIC
143	Class two	CLIC
144	Road	ROAD C
145	Junction	JCT C
146	Hill	HILL C
147	Defile	DEFILE
148	Landing strip	LDGST R
149	Main road	RRC
150	Light wheeled	LWHL C
151	Heavy wheeled	HVWHL C
152	Reconnaissance	RECON C
153	Boats	BT C
154	Aircraft	ACFT C
155	Helicopter	HELIC
156	Light machine gun	LTMGC
157	Anti tank gun	ATGC
158	Heavy machine gun	HVMGC
159	Recoilless rifle	RCLRC
160	Half prone half standing	RAND C
161	Prone	RONE C
162	Prone dug in	RUG C
163	Prone overhead cover	ROVER C
164	Dug in	DUGIN C
165	Under overhead cover	UCOVER C
166	Fair reliability	FR C
167	Poor reliability	POOR C
168	Report value	RCV
169	Strength degree of protection	STRD C
170	Strength of target	STRG C
171	Attitude	ATT C
172	Target radius	TAR C
173	Target length	TAR C
174	Target width	TAR C

Artillery Target Intelligence - Target Report

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	F O	0dttttttFOC
11	F O without laser	0dttttttFOWL C
12	Observer not artillery	0dttttttOBSRRC
13	Long range recon patrol	0dttttttLRRRRC
14	Target base	0dttttttTGTB C
15	Air observer	0dttttttAOBSRRC
16	Sound ranging	0dttttttSORRNGC
17	Flash ranging	0dttttttFLRNGC
18	Counter mortar radar	0dttttttCMRRRC





76	Artillery	ARTY C
77	Assembly areas	ASSYC
78	Building	BLDGC
79	Bridge	BRIDGE C
80	Center	CENMC
81	Equipment	EQUIP C
82	Mortars	MORP C
83	Personnel	PERSC
84	Rockets or Missiles	RKTMSLC
85	Special missions	SPEC C
86	Supply dump	SUPPLY C
87	Terrain features	TERFC
88	Vehicle	VEHC
89	Weapons	WPNC
90	Unknown	UNK C
91	Light	LTC
92	Medium	MDMC
93	Heavy	HVC
94	Missile	MSLC
95	Position	POSC
96	Armored personnel carrier	APCC
97	Troops	TRPC
98	Troops and vehicles	TRPV C
99	Mechanized troops	TRPA C
100	Wood	WOOD C
101	Masonry	MASN C
102	Concrete	CONC C
103	Metal	METC
104	Special purpose	SFCL C
105	Foot pontoon	FTPO C
106	Vehicle pontoon	VEHP C
107	Steel	STEE C
108	Site	SITE C
109	Raft	RAFT C
110	Heavy	FERR C
111	Small	SMAL C
112	Battalion	BNC
113	Regiment	REGT C
114	Division	DIV C
115	Forward	FWDC
116	Radar	RADAR C
117	Electronic warfare	EW C
118	Searchlight	SLTC
119	Guidance	GDNC C
120	Loudspeaker	LSC
121	Very heavy	VHC
122	Infantry	INF C
123	Observation post	OPC
124	Patrol	PTLC
125	Work party	WKPT C
126	Anti personnel	APER C
127	Light missile	LTMS C
128	Medium missile	MDMS C
129	Heavy missile	HVMS C
130	Antitank	ATAN C
131	Illumination one gun	ILL1 C
132	Illumination two guns	ILL2 C
133	Illumination with deflection	ILL2 C
134	Illumination with range	ILL2 C
135	Illumination four guns	ILL4 C
136	Nonpersistent gas	GASN C
137	Persistent gas	GASP C
138	Leaflets	LEAF C
139	Ammunition	AMMO C
140	Antitank	OTLC
141	Bridge equipment	BRGE C
142	Class one	CL1 C



210	Missi on fired	Ca a a a a a a a a a Xc
211	Erase missi on fired	Cd d d d d d d d d d c
212	Confir m target	Ce e e e e e e e e e Xc
213	Erase confir m target	Cf f f f f f f f f f c
214	Observer locati on east	Cg g g g g g g g g g
215	Observer locati on north	Ch h h h h h h h h h
216	Observer alti tude	Ch h h h h h h h h h

Artillery Target Intelligence - Trial Solution

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	Right	10
11	Left	11
12	Cursor reset	C
13	Combined target number	Cd d d
14	Coordinate east	Ce e e e e e e e e e
15	Coordinate north	Cf f f f f f f f f f
16	Altitude	Cg g g g g l l l l l l l l l l
17	Grid zone	Ch h h h h
18	Spheroid	Ch h h h h
19	Erase target number	-----
20	Alpha	A
21	Bravo	B
22	Charlie	C
23	Delta	D
24	Echo	E
25	Fcxtrot	F
26	Golf	G
27	Hotel	H
28	India	I
29	Juliet	J
30	Kilo	K
31	Lima	L
32	Mike	M
33	November	N
34	Oscar	O
35	Papa	P
36	Quebec	Q
37	Romeo	R
38	Sierra	S
39	Tango	T
40	Uniform	U
41	Victory	V
42	Whiskey	W
43	X ray	X
44	Yankee	Y
45	Zulu	Z

Artillery Target Intelligence - Combine Targets

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	Ten	10
11	Eleven	11
12	Cursor reset	00
13	Combined target number	000000
14	Coordinate east	000000
15	Coordinate north	000000
16	Altitude	000000
17	Grid zone	000000
18	Spheroid	000000
19	Erase target number	-----
20	Alpha	A
21	Bravo	B
22	Charlie	C
23	Delta	D
24	Echo	E
25	Foxtrot	F
26	Golf	G
27	Hotel	H
28	India	I
29	Juliet	J
30	Kilo	K
31	Lima	L
32	Mike	M
33	November	N
34	Oscar	O
35	Papa	P
36	Quebec	Q
37	Romeo	R
38	Sierra	S
39	Tango	T
40	Uniform	U
41	Victor	V
42	Whiskey	W
43	X ray	X
44	Yankee	Y
45	Zulu	Z
46	Recombined target number	000000

Artillery Target Intelligence - Split Target

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9

10	A	Alpha	A
11	B	Bravo	B
12	C	Charlie	C
13	D	Delta	D
14	E	Echo	E
15	F	Foxtrot	F
16	G	Golf	G
17	H	Hotel	H
18	I	India	I
19	J	Juliett	J
20	K	Kilo	K
21	L	Lima	L
22	M	Mike	M
23	N	November	N
24	O	Oscar	O
25	P	Papa	P
26	Q	Quebec	Q
27	R	Romeo	R
28	S	Sierra	S
29	T	Tango	T
30	U	Uniform	U
31	V	Victor	V
32	W	Whiskey	W
33	X	Xray	X
34	Y	Yankee	Y
35	Z	Zulu	Z
36		Target number	cdtt
37		Erase target number	cdtt
38		Erase	cdtt_____c
39		Weight	cdtt
40		Cursor reset	cdtt
41		Erase	cdtt

Artillery Target Intelligence - Query

<u>Word number</u>	<u>Phrase Spoken</u>	<u>Output string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	Destination addressee	cdtt
11	Erase destination addressee	cdtt// // // // ___c
12	Abort request	cdttXC
13	Erase abort request	cdttc
14	Count of targets	cdtt1c
15	One line summary	cdtt2c
16	Full report	cdtt3c
17	Erase level of report	cdttc
18	Coordinate report	cdttXC
19	Erase coordinate report	cdttc
20	Shell report	cdttXC
21	Erase shell report	cdttc
22	Solution report	cdttXC
23	Erase solution report	cdttc
24	Location	cdttc
25	Circular search area	cdtt
26	Grid zone second point	cdtt









38	Delete	target number	C
39	Upper	size factor	C
40	Lower	degree of protection	C
41	Upper	degree of protection	C
42	Alpha		A
43	Bravo		B
44	Charlie		C
45	Delta		D
46	Echo		E
47	Fox	troop	F
48	Golf		G
49	Hotel		H
50	India		I
51	Juliet		J
52	Kilo		K
53	Lima		L
54	Mike		M
55	November		N
56	Oscar		O
57	Papa		P
58	Quebec		Q
59	Romeo		R
60	Sierra		S
61	Tango		T
62	Uniform		U
63	Victor		V
64	Whiskey		W
65	X-ray		X
66	Yankee		Y
67	Zulu		Z
68	Lower	type factor	C
69	Upper	type factor	C
70	Lower	strength limit	C
71	Upper	strength limit	C
72	Target	size limits	C
73	Transmit	request	C
74	Grid	zone	X
75	Spheroid		C
76	Missile	on fired	C
77	Erase	mission fired	C
78	Confirmed	target	C
79	Erase	confirmed target	C
80	Erase	subtype	C
81	Erase	transmit request	C
82	Edit	request	C
83	Erase	target type	C
84	Air	defense artillery	A
85	Armor		A
86	Artillery		A
87	Assembly	areas	A
88	Building		B
89	Bridge		B
90	Center		C
91	Equipment		E
92	Mortars		M
93	Personnel		P
94	Rockets	or Missiles	R
95	Special	missions	S
96	Supply	dump	S
97	Terrain	features	T
98	Vehicle		V
99	Weapons		W
100	Unknown		U
101	Light		L
102	Medium		M
103	Heavy		H
104	Missile		M

105	on	
106	personnel carrier	
107		
108	vehicles	
109	troops	
110		
111	type	
112		
113	Special purpose	
114	purpose	
115	pontoon	
116	pontoon	
117		
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131		
132		
133		
134		
135		
136		
137		
138		
139		
140		
141		
142	on one gun	
143	on two guns	
144	on with machine	
145	on four gun	
146		
147	gas	
148		
149		
150		
151	equipment	
152		
153	two	
154		
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168		
169		
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171		

172	Phone dug in	C	BUGC
173	Phone overhead cover	C	PROVERC
174	Dug in	C	DUGINC
175	Under overhead cover	C	COVERC
176	Erase edit request	C	
177	Erase ceqre on protection	C	
178	Excellent reliability	C	-----C
179	Good reliability	C	GC
180	Fair reliability	C	FC
181	Erase reliability	C	CC
182	Print request	C	XC
183	Erase print request	C	C
184	View request	C	XC
185	Erase view request	C	C
186	Show request	C	XC
187	Erase show request	C	C
188	Delete request	C	XC
189	Do not delete request	C	C
190	Search by time	C	
191	Day	H	
192	Hour	H	
193	Minute	H	
194	Newer	C	HHHHHHHHHHHHHHHHHHHH
195	Older	C	HHHHHHHHHHHHHHHHHHHH

Artillery      Target      Intelligence      Standing      Request      For  
Information

<u>Word</u> <u>number</u>	<u>Phrase</u> <u>Spoken</u>	<u>Output</u> <u>string</u>
0	Zero	0
1	One	1
2	Two	2
3	Three	3
4	Four	4
5	Five	5
6	Six	6
7	Seven	7
8	Eight	8
9	Nine	9
10	Destination addressee	C
11	Erase destination addressee	C
12	Abort request	C
13	Erase abort request	C
14	Count of targets	C
15	One line summary	C
16	Full report	C
17	Erase level of report	C
18	Coordinate report	C
19	Erase coordinate report	C
20	Shell report	C
21	Erase shell report	C
22	Solution report	C
23	Erase solution report	C
24	Location	C
25	Circular search area	C
26	Grid zone second point	C
27	Spheroid second point	C
28	Zone of responsibility	C
29	Overlap distance	C
30	Lower report value	C
31	Upper report value	C
32	Lower size factor	C
33	Add SRI	C



101	Sit	CO	SI	EC
102	Strait	CO	STR	STR
103	Heavy	CO	HEAVY	HEAVY
104	Small	CO	SMALL	SMALL
105	Battalion	CO	BATTALION	BATTALION
106	Equipment	CO	EQUIPMENT	EQUIPMENT
107	Division	CO	DIVISION	DIVISION
108	Forward	CO	FORWARD	FORWARD
109	Radar	CO	RADAR	RADAR
110	Electronic warfare	CO	ELECTRONIC WARFARE	ELECTRONIC WARFARE
111	Searchlight	CO	SEARCHLIGHT	SEARCHLIGHT
112	Guidance	CO	GUIDANCE	GUIDANCE
113	Loudspeaker	CO	LOUDSPEAKER	LOUDSPEAKER
114	Very heavy	CO	VERY HEAVY	VERY HEAVY
115	Infantry	CO	INFANTRY	INFANTRY
116	Observation post	CO	OBSERVATION POST	OBSERVATION POST
117	Patrol	CO	PATROL	PATROL
118	Work party	CO	WORK PARTY	WORK PARTY
119	Anti personnel	CO	ANTI PERSONNEL	ANTI PERSONNEL
120	Light missile	CO	LIGHT MISSILE	LIGHT MISSILE
121	Medium missile	CO	MEDIUM MISSILE	MEDIUM MISSILE
122	Heavy missile	CO	HEAVY MISSILE	HEAVY MISSILE
123	Anti tank	CO	ANTI TANK	ANTI TANK
124	Illumination one gun	CO	ILLUMINATION ONE GUN	ILL11C
125	Illumination two guns	CO	ILLUMINATION TWO GUNS	ILL12C
126	Illumination with deflection	CO	ILLUMINATION WITH DEFLECTION	ILL12D
127	Illumination with range	CO	ILLUMINATION WITH RANGE	ILL12R
128	Illumination four guns	CO	ILLUMINATION FOUR GUNS	ILL14C
129	Non persistent gas	CO	NON PERSISTENT GAS	GASNO
130	persistent gas	CO	PERSISTENT GAS	GASPE
131	Leaflets	CO	LEAFLETS	LEAFLETS
132	Ammunition	CO	AMMUNITION	AMMOC
133	petroleum	CO	PETROLEUM	PETROL
134	Bridge equipment	CO	BRIDGE EQUIPMENT	BRIDGEQ
135	Class one	CO	CLASS ONE	CLIC1
136	Class two	CO	CLASS TWO	CLIC2
137	Road	CO	ROAD	ROADC
138	Junction	CO	JUNCTION	JCTC
139	Hill	CO	HILL	HILLC
140	Defile	CO	DEFILE	DEFILC
141	Landing strip	CO	LANDING STRIP	LDGSTR
142	Railroad	CO	RAILROAD	RRRC
143	Light wheeled	CO	LIGHT WHEELED	LTWHL
144	Heavy wheeled	CO	HEAVY WHEELED	HVWHL
145	Reconnaissance	CO	RECONNAISSANCE	RECON
146	Boats	CO	BOATS	BOATC
147	Aircraft	CO	AIRCRAFT	ACFTC
148	Helicopter	CO	HELICOPTER	HELIC
149	Light machine gun	CO	LIGHT MACHINE GUN	LTMG
150	Anti tank gun	CO	ANTI TANK GUN	ATGC
151	Heavy machine gun	CO	HEAVY MACHINE GUN	HVMGC
152	Recoilless rifle	CO	RECOILLESS RIFLE	RCLRC
153	Half prone half standing	CO	HALF PRONE HALF STANDING	PRANDC
154	prone	CO	PRONE	PRONC
155	prone dug in	CO	PRONE DUG IN	PRUGC
156	prone overhead cover	CO	PRONE OVERHEAD COVER	PROVERC
157	Dug in	CO	DUG IN	DUGINC
158	Under overhead cover	CO	UNDER OVERHEAD COVER	COVERC
159	Erase degree of protection	CO	ERASE DEGREE OF PROTECTION	-----C
160	Excellent reliability	CO	EXCELLENT RELIABILITY	-----C
161	Good reliability	CO	GOOD RELIABILITY	-----C
162	Fair reliability	CO	FAIR RELIABILITY	-----C
163	Erase reliability	CO	ERASE RELIABILITY	-----C

Artillery Target Intelligence - Preparation of File Plans

Word number	Phrase Spoken	Output string
0	NO	0
1	NO	0
2	NO	0
3	NO	0
4	NO	0
5	NO	0
6	NO	0
7	NO	0
8	NO	0
9	NO	0
10	NO	0
11	NO	0
12	NO	0
13	NO	0
14	NO	0
15	NO	0
16	NO	0
17	NO	0
18	NO	0
19	NO	0
20	NO	0
21	NO	0
22	NO	0
23	NO	0
24	NO	0
25	NO	0
26	NO	0
27	NO	0
28	NO	0
29	NO	0
30	NO	0
31	NO	0
32	NO	0
33	NO	0
34	NO	0
35	NO	0
36	NO	0
37	NO	0
38	NO	0
39	NO	0
40	NO	0
41	NO	0
42	NO	0
43	NO	0
44	NO	0
45	NO	0
46	NO	0
47	NO	0
48	NO	0
49	NO	0
50	NO	0
51	NO	0
52	NO	0
53	NO	0
54	NO	0
55	NO	0
56	NO	0
57	NO	0
58	NO	0
59	NO	0
60	NO	0
61	NO	0

62	Special missions	CC	UNKC
63	Supply jump	CC	UNKC
64	Temperature	CC	UNKC
65	Vehicles	CC	UNKC
66	Weapons	CC	UNKC
67	Unknown	CC	UNKC
68	Light	CC	UNKC
69	Medium	CC	UNKC
70	Heavy	CC	UNKC
71	Missile	CC	UNKC
72	Position	CC	UNKC
73	Armored personnel carrier	CC	UNKC
74	Troops	CC	UNKC
75	Troops and vehicles	CC	UNKC
76	Mechanized troops	CC	UNKC
77	Wood	CC	UNKC
78	Masonry	CC	UNKC
79	Concrete	CC	UNKC
80	Metal	CC	UNKC
81	Special purpose	CC	UNKC
82	Foot pontoon	CC	UNKC
83	Vehicle pontoon	CC	UNKC
84	Steel	CC	UNKC
85	Plate	CC	UNKC
86	Ramp	CC	UNKC
87	Ferry	CC	UNKC
88	Small	CC	UNKC
89	Battalion	CC	UNKC
90	Regiment	CC	UNKC
91	Division	CC	UNKC
92	Forward	CC	UNKC
93	Radar	CC	UNKC
94	Electronic warfare	CC	UNKC
95	Searchlight	CC	UNKC
96	Guidance	CC	UNKC
97	Loudspeaker	CC	UNKC
98	Very heavy	CC	UNKC
99	Infantry	CC	UNKC
100	Observation post	CC	UNKC
101	Patrol	CC	UNKC
102	Work party	CC	UNKC
103	Anti-personnel	CC	UNKC
104	Light missile	CC	UNKC
105	Medium missile	CC	UNKC
106	Heavy missile	CC	UNKC
107	Anti-tank	CC	UNKC
108	Illumination one gun	CC	UNKC
109	Illumination two guns	CC	UNKC
110	Illumination with deflection	CC	UNKC
111	Illumination with range	CC	UNKC
112	Illumination four guns	CC	UNKC
113	Nonpersistent gas	CC	UNKC
114	Persistent gas	CC	UNKC
115	Leaflets	CC	UNKC
116	Ammunition	CC	UNKC
117	Petroleum	CC	UNKC
118	Bridge equipment	CC	UNKC
119	Class one	CC	UNKC
120	Class two	CC	UNKC
121	Road	CC	UNKC
122	Junction	CC	UNKC
123	Hill	CC	UNKC
124	Defile	CC	UNKC
125	Landings strip	CC	UNKC
126	Railroad	CC	UNKC
127	Light wheeled	CC	UNKC
128	Heavy wheeled	CC	UNKC





strings of numbers for input are much better suited for a continuous speech recognizer because the distinct pause between phrases can be eliminated.

For this reason, it was determined that there was little use in creating the vocabulary for the entire Survey function. When continuous voice recognition equipment is more readily available and thoroughly tested a vocabulary could be developed to make the most of the recognizer's characteristics.

There is one last series of vocabulary words which might be useful if a recognizer is assumed to have the characteristic of an unlimited output. There could exist 96 more vocabulary words, one for each message template. The output string associated with these words could in fact be the message template itself. This would be useful if the operator accidentally did erase or change the template keyword structure. This would eliminate the need for the operator to manually correct the keyword structure. This task would naturally take an extremely long output character string, but could be very useful.

For example, a very short template is the Split Target message template within the Artillery Target Intelligence Function. A sample of this message template is also in Appendix A. The output character string associated with this template would be:

```
"#####;P:r;SB:r/r/r/rr/rrr;C:c rr;SG:rr,rr;DT:rr,rr/rr/rr;
ID:rrrr;A:r;cdATI;SPLIT;TGT:rrr rrr;S:"
```

The right cursor was used to pass over the entry fields in order that any existing data was not erased. It was felt that this alone could be a time savings for the TACFIRE operators.

## V. Vocabulary Test

Numerous tests were conducted on sample TACFIRE vocabularies before the final vocabulary organization was developed. These tests were conducted to help determine which recognizer to use, and under what conditions, such as with gas masks, the recognizer could operate efficiently. These tests are covered in other research reports. After the vocabulary was developed a very small scale test was conducted to insure that the suggested phrases had a reasonable accuracy rate associated with them. This test is not to be considered statistically significant but it was conducted as a preliminary quality assurance indicator.

One very experienced voice recognition user tested one message vocabulary from every TACFIRE Function for which vocabularies were developed. Each of the vocabularies was trained with the necessary ten training passes on the Threshold 600 voice recognizer. After this was done, a test phase was started. In the test phase the vocabulary was checked for proper training by reading through the entire list of words twice. If a misrecognition occurred the word was spoken again. If it missed again, it was retrained. As soon as all of the words passed the two out of three test runs, the experimental phase started.

During the experimental phase, the tester went through the word list four times recording all of the errors. All four trials were done at the same time. The following table lists the rudimentary results of this small accuracy test. The first four values represent the number of errors per trial and the last value is the accuracy rate achieved.

S - User Commands Area	2	0	3	4	98.1%
AFU - Nonnuclear Mission	2	9	4	3	97.7%
M - User Commands	0	3	0	1	97.2%
TFC - Capability Analysis	0	3	2	4	98.8%
NFP - Commander Attack	1	0	2	8	97.2%
ATI - Coordinate Report	3	8	3	4	97.9%

The accuracy rates are fairly good. There could be some further utterance refinement, but generally the phrases selected are consistent with the field description in the documentation, and receive more than adequate recognition accuracy.

## VI. Conclusions

This completes the presentation of the TACFIRE vocabulary. It turned out to be much larger than the researchers were led to believe at the beginning of the research effort. It appears as if one or two of the message templates come fairly close to meeting the limits of the Threshold 600 recognizer, but a 300 word recognition capability would be more than sufficient.

The vocabulary developed has many nice features as was pointed out in the above discussion. These features if incorporated into a voice system for TACFIRE would make the operator's job easier. A system which can fulfill TACFIRE's unique vocabulary requirements can be created with the voice data entry technology which has been demonstrated. At present there does not exist an off the shelf recognizer which will fulfill all of the requirements, but it is of the opinion of the researchers one could be developed. This would require a restructuring of the TACFIRE vocabulary and integration of a recognizer into the TACFIRE computer.

APPENDIX A  
Sample Templates

TYPICAL TACFIRE MESSAGE FORMAT

AMMUNITION AND FIRE UNIT UPDATE INPUT MESSAGE FORMAT  
USED TO INPUT NEW OR UPDATE EXISTING FIRE UNIT DATA

\_\_\_\_\_;P:;SB:\_\_\_/\_\_\_/\_\_\_;C:\_\_\_;SG:\_\_\_;DT:\_\_\_/\_\_\_/\_\_\_;ID:\_\_\_;A:;\_  
AFU;UPDATE;PLAN:\_\_\_\_\_;FU:\_\_\_/\_\_\_/\_\_\_;WPN:\_\_\_\_\_;MODEL:\_\_\_\_\_;MSN:\_\_\_\_\_;  
CORD:\_\_\_/\_\_\_/\_\_\_;GZ:\_\_\_;SPHERE:;APPL:\_\_\_/\_\_\_;ST:;ZONE:\_\_\_\_\_;  
WSTR:;AZ:\_\_\_\_\_;TIMEO:\_\_\_\_\_;FUTYPE:;UREINF:\_\_\_/\_\_\_/\_\_\_;FSP:\_\_\_/\_\_\_/\_\_\_;  
DELETE:;RT:;RS:;READY:;OUTTIL:\_\_\_/\_\_\_;BL:\_\_\_\_\_;MINRNG:\_\_\_\_\_;  
BTG:\_\_\_/\_\_\_/\_\_\_F

\_\_\_\_;P:\_\_\_\_;SB:\_\_\_\_/\_\_\_\_/\_\_\_\_/\_\_\_\_;C:\_\_\_\_;SG:\_\_\_\_;DT:\_\_\_\_/\_\_\_\_/\_\_\_\_;ID:\_\_\_\_;A:\_\_\_\_;  
ATTI;SPLIT;TGT:\_\_\_\_;S:\_\_\_\_

Split Target message template

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